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WAR AMENORRHEA

A CLINICAL AND LABORATORY STUDY

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Soon after our arrival at the Santo Tomas Internment Camp in Manila, Philippines, on Jan. 4, 1942 a high incidence of amenorrhea was noticed. In the middle of June there were 3,134 internees, of whom 1,172 were women. All but 26 of the latter were American or British. Of the 1,172 there were 1,042 between the ages of 14 and 45 years. By April it was evident that the high incidence of amenorrhea had persisted and among the 1,042 women of menstrual age we were able to find 125 patients with amenorrhea which had developed since the outbreak of the war. Many complained of irregular menstrual periods, but only a few patients suffering from menorrhagia were seen. The menses returned in many instances after several months' absence. Another illustrative group was the army nurses who went through the campaigns of Bataan or Corregidor and were interned on July 2. Of the 60 nurses interned, 14 had amenorrhea, 7 dysmenorrhea, 5 menorrhagia and 4 irregular menstrual periods. Menstrual disturbances were therefore present in 50 per cent and amenorrhea in 23 per cent of the nurses, while in the appropriate age group in the camp as a whole the incidence of amenorrhea was 14.8 per cent. It was suspected that the cause of the amenorrhea was an endocrine one, and in spite of the shortage or absence of some reagents and laboratory animals, which limited quantitative determinations, it was decided to attempt to investigate the cause of this condition.

ETIOLOGY

Secondary amenorrhea is seen in women who have menstruated for a varying length of time. The term functional amenorrhea means that menstruation has ceased although both the uterus and the ovaries are apparently normal. The causes are many and include malnutrition, endocrine disturbances especially of the anterior lobe of the hypophysis, the wasting diseases, chronic intoxications, emotional disturbances and certain neuroses and psychoses. However, we are concerned here with amenorrhea as associated with war.

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The widespread prevalence of amenorrhea in central Europe during and after the first world war called forth considerable comment there but is scarcely mentioned in the French, British or American literature. Von Jaworski [1] of Warsaw in 1916, the first to report his observations on this condition, thought it was due to poor nutrition and disturbances in metabolism. Dietrich [2] of Göttingen in 1917 recognized the association of the increased incidence of amenorrhea with the war and suggested in the German medical literature the name "kriegsamenorrhöe" or war amenorrhea, which term is commonly used. He considered malnutrition and hard work the most important of its causes, with psychic influences as a secondary factor. From Berlin, Bakofen [3] reported his observations on war amenorrhea. He and others suggested that the consumption of grain containing ergot may have caused amenorrhea through its prolonged influence of contraction of the uterine blood vessels, but no instances of ergot poisoning or gangrene were mentioned. He was not impressed with the possibility of psychic influences. Von Lingen [4] studied 320 patients with this disturbance in Leningrad and thought the causes were poor food and hard work. He agreed with others that the improper diet caused cessation of ovarian secretion which resulted in amenorrhea. Nilsson [5] of Stockholm thought this condition in Sweden was due to faulty diet and especially to the lack of milk and the unfavorable proportions of the various physiologic salts. Teebken [6] of Kiel made an extensive study of 375 patients with amenorrhea occurring from 1916 to 1919 and an additional 120 cases from 1920 to 1926. He concluded that the prolonged deficiency of protein and also fat was the most important cause and that other factors such as a psychic insult, increase in hard work and sexual abstinence had little to do with it. Graff and Nowak [7] of Vienna found that lack of protein was the principal cause of the war amenorrhea. It is evident from the foregoing that the European writers considered that the most important cause of the amenorrhea of World War I was a deficiency in one or more of the essential food factors.

In many of our patients the menses stopped abruptly after the first bombing of Manila or soon after internment and before a food deficiency could have any effect. We must therefore look for another cause. This study continued for several months after the

1. von Jaworski, J.: Mangelhafte Ernährung als Ursache von Sexualstörungen bei Frauen, Wien. klin. Wchnschr. **29:** 1068 (Aug. 24) 1916.
2. Dietrich, H. A.: Kriegsamenorrhöe, Zentralbl. f. Gynäk. **41:** 157 (Feb. 10) 1917.
3. Bakofen: Kriegserscheinungen in Gynäkologie und Geburtshilfe, Deutsche med. Wchnschr. **45:** 212 (Feb. 20) 1919.
4. von Lingen, L.: Kriegsamenorrhoe in Petersburg, Zentralbl. f. Gynäk. **45:** 1247 (Sept. 3) 1921.
5. Nilsson, A.: Ueber sogenannten Kriegsamenorrhöe, Zentralbl. f. Gynäk. **44:** 876 (Aug. 7) 1920.
6. Teebken, G.: Amenorrhöe in der Kriegs- und Nachkreigszeit: Ein Rückblick im 10 Jahre nach dem Kriege, Zentralbl. f. Gynäk. **52:** 2966 (Nov. 17) 1928.
7. Graff, E., and Nowak, J.: Amenorrhöe in der Kriegs- und Nachkriegszeit, Zentralbl. f. Gynäk. **53:** 598 (March 9) 1929.

onset of the condition, so that the physiologic amenorrhea of pregnancy, or fear of it, was ruled out. Also patients with chronic diseases were omitted. It seems clear that emotional shock had much to do with the cause of this widespread amenorrhea, and we thought it desirable to study the effect of such shock on the ovarian and anterior pituitary-like gonadotropic excretions in the urine.

TABLE 1.—*Estrogen Determination in the Urine from Two Representative Patients*

Sample No.	Date	Patient 1* Volume in Cc.	Patient 1* Result	Patient 2 Volume in Cc.	Patient 2 Result
1	June 23, 1942	765	Negative	870	Negative
2	June 25, 1942	1,320	Negative	1,320	Negative
3	June 27, 1942	1,020	Negative	1,020	Negative
4	June 29, 1942	1,030	Negative	760	Negative
5	July 1, 1942	1,080	Negative	750	Negative
6	July 3, 1942	1,070	Negative	1,270	Negative
7	July 5, 1942	990	Negative	1,200	Negative
8	July 7, 1942	1,220	Negative	900	Negative
9	July 9, 1942	910	Negative	770	Negative
10	July 11, 1942	1,570	Negative	1,040	Negative
11	July 13, 1942	1,840	Negative	650	Negative
12	July 15, 1942	1,540	Negative	840	Negative
13	July 17, 1942	1,850	Negative	1,580	Negative
14	July 19, 1942	1,160	Negative	1,550	Negative
15	July 21, 1942	1,250	Negative	710	Negative

* Estrogen was demonstrated after return of the menses.

MATERIAL

From the 125 women with amenorrhea who were interned in January 1942 2 representative patients were selected, the histories of whom are briefly as follows:

CASE 1.—E. D., a white American secretary, single, aged 26, interned on January 4, was born in Shanghai and had lived in the Orient all her life and in Manila for the past four years. Two years ago a subtotal thyroidectomy was performed, but her menstrual periods were not affected before or after operation. The medical and surgical history was otherwise irrelevant.

TABLE 2.—*Quantitative Gonadotropin Determination of Urine Specimens by the Uterine Weight Method*

Urine of Patient	Dilution	Dose, Cc.	Total Amount Injected, Cc.	Uterine Weight, Mg.	Ovarian Weight, Mg.	Body Weight, Gm.
Patient 1						
Sample 2.....	7×	0.3	1.8	37	17	47
Patient 1						
Sample 8.....	7×	0.3	1.8	16	13	3 weeks
	×	0.3	1.8	11.5	13	old rats
	1/7×	0.3	1.8	15.0	13	
Patient 1						
Pooled specimen...	×	0.3	1.8	11	14	22.5
	7×	0.3	1.8	12	15	27.0
	7×	0.6	3.6	12	9	22.0
	7×	1.0	6.0	18	17	31.0
Patient 2						
Pooled specimen...	×	0.3	1.8	10	8	22.0
	7×	0.3	1.8	12	13	25
	7×	0.6	3.6	13	12	26
	7×	1.0	6.0	27	19	29
Specimen 10 mos. later						
Patient 1.....	7×	0.3	1.8	17	14	28
Patient 2.....	7×	0.3	1.8	6.2	7.4	39

Injections three times daily for two days.
Animals examined post mortem seventy-two hours after first injection.
7×, original concentration of urine specimen.
×, dilution of concentrated specimen.

She had no loss of weight in camp. Her menses began at 13 years of age, had always been regular with a twenty-nine day interval and four to five day duration until January 10, six days after internment, when she had a ten day menstrual flow followed by amenorrhea of ten months' duration. On physical examination she was tall (5 feet 11 inches, or 180 cm.), slender, with brown hair, and weighed 123 pounds (56 Kg.). The pulse was 80 to the minute and the blood pressure was 120 systolic and 80 diastolic. The thyroid gland was not palpable and the heart and lungs were normal. The hemoglobin was 75 per cent and the erythrocyte count 4,100,000 per cubic millimeter of blood. On pelvic examination the introitus was virginal and the cervix and uterine body and also the adnexa were found to be normal.

CASE 2.—L. M., a white American housewife aged 28, interned on January 8, was born and has always lived in Manila. A benign breast nodule was removed in 1937 but otherwise the medical and surgical history was not important. She gained 12 pounds (5.4 Kg.) while in camp. Her menses began at 11 years of age and have always been regular, of twenty-eight day interval and four to five days' duration, except during the one and only pregnancy five years ago. Her last period was on Dec. 12, 1941, and except for a one day spotting she has had amenorrhea for twenty months. She had no complaints or other symptoms except the amenorrhea. On physical examination she was medium in height (5 feet 3 inches, or 160 cm.) and weighed 112 pounds (51 Kg.), and no abnormalities of the head and neck, chest or abdomen were found. The blood pressure was 120/80 and the pulse rate was 72 to the minute. The hemoglobin was 80 per cent and the red blood cells were 4,300,000 per cubic millimeter. On pelvic examination the introitus was parous, the cervix slightly irregular, the uterine body normal in size, shape and position and the adnexa were not unusual.

TABLE 3.—*Results of Assay for Gonadotropic Substance in the Urine*

Sample No.	Patient 1 Weight of Rat in Gm.	Patient 1 Follicle Stimulation	Patient 2 Weight of Rat in Gm.	Patient 2 Follicle Stimulation
1	39.4		43	
	37	Negative	28.6	Positive
2	58		39.8	
	39	Positive	25.4	Negative
3	42		39.8	
	38	Negative	30.2	Negative
4	..		31	
	47	Negative	30	Positive
5	39.8		27	
	37	Negative	29.8	Negative
6	41.4		29	
	40.4	Positive	29	Positive
7	49		25	
	52	Negative	30	Positive
8	58		27	
	47	Positive	28.8	Negative
9	47		29.4	
	50.4	Positive	31	Positive
10	38.4		25	
	47	Negative	33	Negative
11	39		35	
	39.9	Positive	40	Positive
12	64		55	
	41	Negative	35	Negative
13	39.8		42	
	41	Positive	31	Negative
14	47		37	
	31.6	Positive	35.6	Negative
15	53		32	
	38	Negative	33	Negative

As the extraction of single specimens of the urine may give little information as to ovarian and anterior pituitary function, a longer time was utilized. The full twenty-four hour output except for the first morning specimen was collected and extracted for estrogenic substance every other day from June 23 to July 21, 1942, thus including the time of a complete cycle. The single morning specimens were kept separate and extracted for anterior pituitary-like gonadotropic substance.

METHOD

No attempt is made to review the voluminous literature on the extraction and assay of these hormones. For estrogen extraction a modification of the method of Marrian was used.

The twenty-four hour specimen of urine was measured and acidified to p_H 1.5 with concentrated hydrochloric acid, was boiled for at least an hour and when cool was extracted twice with 500 cc. of benzene. Benzene fractions were combined and extracted twice

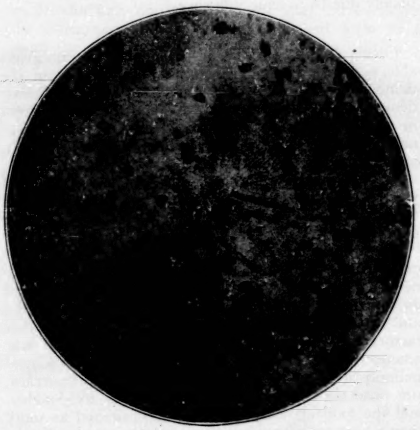

Fig. 1.—Vaginal smear from adult castrate rat showing only leukocytes—no estrogenic response; reduced from a photomicrograph with a magnification of 500 diameters.

with 250 cc. of fifth normal sodium hydroxide. The sodium hydroxide fractions were combined and acidified with concentrated hydrochloric acid to p_H 1.5. This was extracted again twice with 500 cc. of benzene. The benzene was then distilled off, leaving 5 to 10 cc. This was transferred to a small flask and evaporated to dryness under partial vacuum. The dry residue was picked up in 10 cc. of ether and 10 cc. of sesame oil, was dissolved by shaking, and the ether driven off in vacuum. The oily extract was then assayed.

Assay: Five-tenths cc. of sesame oil extract was injected subcutaneously in the back of each of 2 adult castrated female albino rats of the Wistar strain in the morning, in the afternoon and in the morning of the day following. (The total injected was 1.5 cc. per rat.) Vaginal smears of rats were made before and twenty-four and thirty-six hours after the last injection.

Extraction of anterior pituitary-like gonadotropic substance: A modification of Zondek's method as mentioned by Kurzrok [8] was used. The volume of 47 cc. of first morning urine was placed in a 250 cc. centrifuge tube and about 200 cc. of 95 per cent alcohol added and allowed to stand overnight or at least two hours. This was then centrifuged and the supernatant fluid was discarded. Twenty cc. of ether was added to the residue and shaken. This was centrifuged and supernatant fluid discarded. The precipitate was allowed to dry well. Then 7 cc. of distilled water was added and shaken for ten minutes in a mechanical shaker. This was centrifuged again and the supernatant fluid collected and assayed.

Assay: Two immature female albino rats of the Wistar strain were used for each specimen. These animals were injected subcutaneously twice daily for three days with 0.25 cc. of the specimen (the total amount injected was 1.5 cc.). Autopsy of animals was done on the fifth day and the ovaries were examined microscopically for follicles and corpora lutea.

Several months later a few more rats became available and, as a small amount of material from all specimens remained, it was used according to the uterine weight technic suggested by Delfs [9] for the assay of serum gonadotropin. Only one rat could be used for each dilution of material. The dose and dilutions are shown in table 2. Subcutaneous injections were given three times daily for two days, and autopsy of the animals was done at the end of seventy-two hours. The uteri were dissected from the peritoneal fold and cut at each end at the junction with the ovary and cervix, and the uteri and ovaries were weighed separately.

RESULTS

During the determination of the presence of estrogen, which was done promptly after the extraction of urine, the test rats reacted to priming doses of a known estrogen, but all the vaginal smears from the same rats injected with the extracts of urine from both patients were completely negative. An example is shown in figure 1. One more extraction and assay was done by the same technic on the urine of patient 1 after the return of her menses. The urine was collected on the approximate day of ovulation. The full estrous response is shown in figure 2, which indicates at least 6.6 rat units in twenty-four hours. No later estrogen determination was done in reference to patient 2, as she had failed to menstruate.

In the determination of gonadotropin, only follicle stimulation, with no luteinization, was observed, as

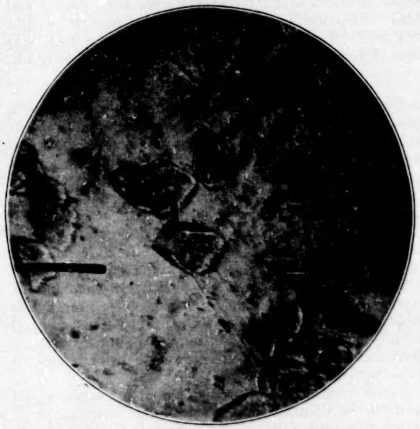

Fig. 2.—Vaginal smear from adult castrate rat showing absence of leukocytes and presence of cornified epithelial cells—full estrous response; reduced from a photomicrograph with a magnification of 450 diameters.

is seen after castration or after the menopause. The reaction in the ovary of the test animal from specimen 2 of patient 1 is shown in figure 4, as compared with the control (fig. 3).

8. Kurzrok, Raphael: Endocrines in Obstetrics and Gynecology, Baltimore, Williams & Wilkins Company, 1937, p. 454.

9. Delfs, E.: An Assay Method for Chorionic Gonadotropin, Endocrinology **28**: 196 (Feb.) 1941.

By the uterine weight method, on another series of rats, this same specimen produced an increase in the weight of the uterus of about 150 per cent as compared to the average weight of the uteri (15 mg.) of 3 control animals. Urine gonadotropin appears to have been increased, as demonstrated by both follicle stimulation and increase in the uterine weights. Another specimen showed little if any effect. The remaining small amounts of all specimens were later pooled and little influence on the increase in uterine weight (table 2) was produced. This pooled specimen was over 1 year old, which may have influenced the result.

Fig. 3.—Ovary from control immature rat with a body weight of 40 grams; reduced from a photomicrograph with a magnification of 70 diameters

TREATMENT

Functional amenorrhea is a symptom rather than a disease and, if continued for only a few months, probably does no permanent damage. It suggests ovarian hypofunction but, if prolonged, for example for several years, regressive changes in the genital tract might take place. Regular menstruation depends on good health, both mental as well as physical. It is common for women to complain of many discomforts which are relieved by menstruation, but only a few of our patients had symptoms which would mildly suggest a premature menopause. Most of the women in this report overcame the difficulty themselves after a few months. Psychotherapy is within the bounds of good medical practice, and suggestion or assurance that no permanent harm will result may have helped some of these patients.

Active treatment with gonadotropic substance would seem to be contraindicated as, in our material, it is at least present if not slightly increased, although the ovaries do not respond to it. Very few endocrine preparations were available, and most of the small supply of estrogenic substance was reserved for the patients with symptoms of the menopause. We had a small supply of vitamin E in the form of wheat germ oil. Ten patients were given a dose of 20 drops orally three times daily for a period of ten days preceding the expected menstrual flow. Eight of the 10 patients had a menstrual period or uterine bleeding, and 1 other experienced severe lower abdominal cramps but no bleeding. Experimental evidence on the stimulating effect of vitamin E on the generative tract, according to Mattili,[10] is contradictory and we assumed that the good results in this short series may have been mainly due to psychic influences.

COMMENT

Owing to the limitation in the number of rats available, quantitative findings as to gonadotropin in the urine were not very satisfactory, but it was at least demonstrated to be present. If it had been present in excessive amounts, one would assume that permament ovarian damage was present, which carries a poor prognosis for the patient.

We may have confidence in the finding that estrogen was absent during the amenorrhea and appeared when the menstrual cycle was reestablished, as would be expected.

The ovaries not only are influenced by other endocrine glands but are under the control of the autonomic nervous system. As distinguished from the causes of amenorrhea as reported from central Europe during and after the first world war, malnutrition and other factors were not important in the causation of the war amenorrhea observed in Manila. Although prolonged malnutrition may be considered a cause of amenorrhea, the onset in this group of patients was too sudden, and the food allowance cannot be considered as more than a later contributing factor. In many cases amenorrhea occurred even before internment, as seen in case 2. Very little is known as to the precise role of the special senses in mediating external stimuli in regard to the sex apparatus.[11] We believe that severe psychic shock, worry and especially fear caused a suppression of ovarian function by way of the autonomic nervous system, thereby removing a possible inhibitory effect of estrogen on the anterior lobe of the pituitary.

Fig. 4.—Ovary from immature rat of test series with a body weight of 39 grams, showing follicle stimulation; reduced from a photomicrograph with a magnification of 70 diameters. Urine specimen 2 of patient 1.

10. Mattili, H. A.: Vitamin E, in The Vitamins, Chicago, American Medical Association Press, 1939, p. 592.

11. Marshall, quoted by Stone, C. P., in Allen, Edgar; Danforth, C. H., and Doisy, E. A.: Sex and Internal Secretions, ed. 2, Baltimore, Williams & Wilkins Company, 1939, p. 1218.

SUMMARY

1. As a result of the war 14.8 per cent of the women in the Santo Tomas Internment Camp at Manila, Philippines, suffered from amenorrhea. Other menstrual disturbances were less frequent.

2. Although nutritional factors may have resulted in amenorrhea developing later, it had little to do with the sudden onset of this widespread condition.

3. In 2 selected patients, estrogen was absent from the urine and anterior pituitary-like gonadotropin was present, probably increased in amount.

4. The war amenorrhea observed in Manila was probably due to severe psychic shock, worry and fear, which, acting through the autonomic nervous system, caused a complete suppression of ovarian function.

5. Reassurance of the patient is a part of treatment. Active treatment, where required in this group of patients, should be by the administration of estrogenic substance rather than gonadotropic material.

In the absence of estrogenic substance, vitamin E in the form of wheat germ oil was used. The good results obtained were probably psychic in nature.

SENSITIVITY TO TOPICAL APPLICATION OF SULFATHIAZOLE OINTMENT

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The recent widespread use of sulfathiazole ointment has revealed cases of sulfathiazole sensitivity.[1] My aim in this paper is to call attention to the degree of sensitivity to sulfathiazole ointment existing among the general population. The majority of the cases were of a minor surgical nature rather than dermatologic and might therefore show a different amount of sensitivity (probably less) than would a large group of dermatoses.

MATERIAL

Two hundred and eighteen patients were treated topically with 5 per cent sulfathiazole ointment during the period from Jan. 1, 1943 to July 1, 1943. The ointment consisted of anhydrous wool fat 30 per cent, water 25 per cent, white petrolatum 40 per cent and sodium sulfathiazole 5 per cent. No information was found in the literature as to the incidence of sensitivity resulting from hydrous wool fat or petrolatum except that the sulfur dioxide, used to bleach yellow petrolatum white, had occasionally caused some sensitivity reactions. It may be assumed that there has been little sensitivity to hydrous wool fat or petrolatum observed. The cases consisted of 73 lacerated wounds, 16 leg or ankle ulcers, 41 contused and abraded wounds, 38 burns (9 first degree, 22 second degree, 7 third degree), 12 amputations of fingers or toes and 28 miscellaneous infections and other conditions (table 1). The patients were almost entirely male adults; 7.5 per cent were Negroes. The period of treatment varied from one day (in cases transferred to the hospital) to two and a half months, and the number of treatments from one to sixteen.

From the Department of Surgery, U. S. Marine Hospital No. 70, New York. Approved for publication by Thomas Parran, Surgeon General, U. S. P. H. S.

1. Weiner, Alfred L.: Cutaneous Hypersensitivity to Topical Application of Sulfathiazole, J. A. M. A. **121**: 411-413 (Feb. 6) 1943.

FINDINGS

Sensitivity to sulfathiazole ointment was found to be present in 12 cases (5.5 per cent). One Negro patient (8.3 per cent) was included in the group of sensitive patients. This patient did not show an acute reaction or an extensive slowly developing sensitivity reaction but a chronic reaction with inhibition of normal healing.

The acute reaction consisted of an erythematous macular or papular and in some cases vesicular or pustular eruption. In the acute cases the reaction was always more generalized than in the chronic cases. Pruritus was always present in the acute cases and frequently in the more chronic cases. Later an eczematous eruption with oozing and crusting often developed. In the chronic cases epidermolysis took place with an exposure of the underlying skin layers. This underlying skin appeared smooth, shiny and red, probably because of the exposure of the rete and subsequent edematous degeneration of the rete cells. The pathologic condition is probably similar to that in eczema and dermatitis venenata,[2] in which an initial edema of the transitional cell layers and the granular layers of the skin retards granulation and interferes with proper keratinization. The developing exudation continues to cast off the corneous layer. Sensitivity did not appear in less than twelve hours in any case following the topical application of 5 per cent sulfathiazole ointment.

The time of sensitivity as noted in cases showing sensitivity is given in table 2. Patients 1 and 2 showed sensitivity at the time of admission from previously applied sulfathiazole ointment. Patient 2 appeared with an acute generalized erythematous, macular eruption two days after the initial application of sulfathiazole ointment to a small second degree burn of the right forearm. Patient 1, sensitive on admission, presented an oozing, crusted, eczematous reaction from the knee to the ankle of the right leg. It had been gradually developing over a five month period during which time 5 per cent sulfathiazole ointment had been applied topically to an abrasion of the leg the site of which was now lost in the generalized eczematous reaction. Sulfathiazole ointment was discontinued. The crusts were completely removed with hydrogen peroxide pledgets. Ammoniated mercury ointment 5 per cent was applied liberally and the leg bandaged loosely. This treatment was given on three visits, and the leg was healed by the ninth day. There was no scarification following healing. This patient and 7 other patients who were tested gave a positive patch test.

TABLE 1.—*Miscellaneous Conditions Treated*

1. Miscellaneous infections	
Abscesses	2
Furuncle	2
Paronychium	2
Incised felon	2
Infected laceration	2
Infected abrasion	1
Incised infected sebaceous cyst	1
Postoperative bursitis	1
Chronic osteomyelitis wound	1
2. Frostbite	4
3. Avulsion of finger nails	4
4. Dog bite	3
5. Foreign body puncture wounds	3

Patients 5 and 8 had an exacerbation of the sensitization reaction following the oral administration of

2. Stelwagon, H. W., and Gaskill, H. K.: Diseases of the Skin, Philadelphia, W. B. Saunders Company, 1923, pp. 194 and 283.

1 Gm. of sulfathiazole. The lesions under treatment underwent local exacerbation, while at the same time an erythematous macular eruption appeared on the face, forearms, hands and thorax. Pruritus was prominent in the area of eruption and at the site of local application. Patient 8 was given the drug for treatment of a concomitant gonorrhea.

Four patients showed their sensitivity within six days. The remaining 8 patients were found to have a low grade sensitivity which was noted clinically to have inhibited healing. This low grade sensitivity was probably present sooner, but manifestations were not noted until the time indicated in each case.

REVIEW OF LITERATURE

The use of sulfathiazole ointment topically has been considered to be a relatively innocuous type of treatment. Unfavorable reactions have, however, been reported. Miller [3] reports 5 cases (4.3 per cent) of contact dermatitis due to sulfathiazole ointment from a total of 115 cases. The Robinsons [4] found 2 cases (2.3 per cent) of contact dermatitis among 86 cases in which more than one treatment with 5 per cent sulfathiazole ointment was administered. In the present study 12 cases (5.5 per cent) of 218 were found to show sensitiveness to the topical application of sulfathiazole ointment. This percentage of sensitive patients agrees closely with the amount of sensitivity found by Long and Edwards [5] in treatment with sulfathiazole given orally. They state that of 271 patients treated 5 per cent developed rashes which progressed to an exfoliative dermatitis on continuation of medication. Klingensmith [6] has reported a case of severe necrosis of the skin following oral sulfathiazole administration. The description of this case fits the more chronic localized reactions reported in the present paper. Spink and Hansen [7] reported that the incidence of dermatitis was 9 per cent in a series of 100 patients treated with sulfathiazole orally. Livingood and Pillsbury [8] reported 12 cases in which there was an exacerbation of the sensitization reaction locally from sulfathiazole ointment following the oral administration of sulfathiazole. These cases are similar to the 2 cases (5 and 8) reported in the present study to 2 cases reported by Cohen, Thomas and Kalisch [8] and to 4 cases reported by Shaffer, Lentz and McGuire.[8]

TABLE 2.—*Cases Showing Sensitivity to Topical Application of Sulfathiazole Ointment*

Case	Race	Diagnosis	Number of Treatments Before Reaction Noted	Time from Beginning of Treatment to Time Reaction Noted	Patch Test	Time to Heal After Sulfathiazole Discontinued	Comment
1	W	Abrasion and contusion	?	5 mos.	Positive	9 days	
2	W	Second degree burn	?	2 days	None	Transferred to hospital	
3	W	Abrasion and contusion	1	1 day	Positive	10 days	
4	W	Infected laceration	2	6 days	Positive	5 days	
5	W	Laceration	2	4 days	None	Not healed 1 month and 12 days	Oral sulfathiazole; exacerbation of local symptoms
6	W	Abrasion and contusion	2	8 days	Positive	24 days	
7	W	Avulsion of nail	3	9 days	None	18 days	
8	W	Partial finger amputation	7	28 days	Positive	11 days	Oral sulfathiazole; exacerbation of local symptoms; gonorrhea
9	W	Third degree burns	8	24 days	None	46 days	
10	W	Partial finger amputation	10	28 days	Positive	47 days	
11	W	Dog bite	9	28 days	Positive	21 days	
12	N	Laceration	16	49 days	Positive	18 days	

SUMMARY AND COMMENT

In the present study 5.5 per cent of the patients treated were found to be sensitive to the topical application of sulfathiazole ointment. The permanence of this sensitivity is not yet known. The contact dermatitis in each case disappeared when the sulfathiazole ointment was no longer applied. Clinically it seemed that healing had been definitely slowed.

In a patient who is being treated topically with sulfathiazole ointment it is becoming recognized [8] (present study) that an acute exacerbation of symptoms locally and generally may follow the oral administration of sulfathiazole. Because this sensitivity may preclude the use of the drug in the therapy of such diseases as meningitis, pneumonia and gonorrhea, it is important that sulfathiazole and other sulfonamide preparations be used topically only when a specific need for them can be justified.

The indiscriminate use of these preparations in minor conditions, when less harmful drugs are adequate, should be discontinued. With the widespread publicity being given to these preparations it would seem desirable to prevent or discourage their sale except by prescription.

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4. Robinson, H. M., and Robinson, H. M., Jr.: Local Use of Sulfathiazole in Dermatoses, South. M. J. **34:** 1093-1095 (Nov.) 1941. Miller,[3] Livingood and Pillsbury.[8]

5. Long, P. H.; Haviland, J. W.; Edwards, Lydia B., and Bliss, Eleanor A.: Toxic Manifestations of Sulfanilamide and Its Derivatives with Reference to Their Importance in Course of Therapy, J. A. M. A. **115:** 364-368 (Aug. 3) 1940.

6. Klingensmith, W. R.: Necrosis of the Skin Due to Sulfathiazole, Texas State J. Med. **37:** 313-314 (Aug.) 1941.

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8. Livingood, C. S., and Pillsbury, D. M.: Sulfathiazole in Eczematous Pyoderma, J. A. M. A. **121:** 406-408 (Feb. 6) 1943. Cohen, M. H.; Thomas, H. E., and Kalisch, A. C.: Hypersensitivity Produced by the Topical Application of Sulfathiazole, ibid. **121:** 408-411 (Feb. 6) 1943. Shaffer, Bertram; Lentz, J. W., and McGuire, James A.: Sulfathiazole Eruptions: Sensitivity Induced by Local Therapy and Elicited by Oral Medication, ibid. **123:** 17-23 (Sept. 4) 1943.

Pain.—Pain is a definite esthetic experience which appears to be limited to animal life. It is probably one of the earliest of our developed senses and is important as a warning of danger to the organism. The management of pain constitutes a serious clinical problem not only because of itself as a distressing experience but also because continued pain has been demonstrated to have deleterious action on such vital organs as the heart and kidneys.—Hardy, James D.; Wolff, Harold G., and Goodell, Helen: The Pain Threshold in Man, Research Publications, Association for Research in Nervous and Mental Disease, Baltimore, Williams & Wilkins Company, 1943.

TREATMENT OF FRESH TRAUMATIC WOUNDS

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The successful treatment of traumatic wounds is probably the most challenging problem in surgery today. Modern life has resulted in an increasing exposure to the hazards of motorized land, air and sea transportation, to those of mechanized industry and to those of modern war. This has produced an enormous increase in the number of extensive and severe wounds.

The treatment of both civil and war wounds is based on the same fundamental surgical principles. In war surgery, however, the execution of the principles is frequently compromised by such factors as stress, time lag, severe shock or lack of materials.

The primary purpose of the treatment of wounded persons is "to save life" by preventing or arresting hemorrhage, by allaying shock and by preventing or controlling infection. The secondary purpose is to save the injured part and restore it as rapidly and as effectively as possible to normal function and appearance. It must be remembered at all times that it is not a wound that is being treated but a patient with a wound.

CONTROL OF HEMORRHAGE

When the wounded patient is first seen by the surgeon, the control of any existing hemorrhage is first accomplished. At this clinic emphasis is placed on the arrest of hemorrhage in most wounds simply by the use of pressure over sterile gauze dressings applied directly to the wound.[1]

Elevation of the injured extremity may aid greatly in the arrest of venous bleeding. In the case of active bleeding from a large vessel not controlled by pressure applied through a dressing or directly over the injured vessel, the careful application of a hemostat to the bleeding points is done. We agree with Koch [2] in that such clamps should remain in the wound and should be incorporated in the dressing until the time of débridement. In our clinic a tourniquet is not used for the emergency control of hemorrhage except in extremities so badly crushed or torn that amputation obviously is necessary. It is then applied as close to the wound as possible and is also useful in stopping absorption of toxic products from the mangled tissues. Furthermore, many patients are seen on their admission to the hospital with improperly applied tourniquets which actually increase the amount of venous bleeding from their wounds. When such tourniquets are released and the part elevated, the bleeding frequently stops at once.

A sterile gauze dressing is applied to the open bleeding wound not only to control bleeding but also to minimize added bacterial contamination, particularly from human sources. The earlier a sterile dressing is applied to the wound, the less chance there is for this type of contamination to occur caused by virulent hemolytic staphylococci, hemolytic streptococci and other bacteria arising from unmasked upper respiratory tracts of the patient or any one treating or observing the wound, from ungloved hands, from unsterile instruments or linens, or from bacteria laden dust in a busy receiving ward. These sources of additional contamination have been repeatedly stressed by Miles and his associates,[3] Hare,[4] Colebrook,[5] Fleming [6] and Koch.[2] At the Cincinnati General Hospital it has been found [7] that 35.3 per cent of the wounds are already contaminated by the hemolytic Staphylococcus aureus at the time of débridement. This finding indicates the high degree of secondary contamination that may occur in a general hospital practice during the administration of first aid, the transportation of the wounded person to the hospital, and his examination and observation in the receiving ward just prior to operation. It also emphasizes the great importance of having all personnel treating patients with open wounds adequately masked. No attempt of any kind is made in the receiving ward to cleanse or "sterilize" such wounds.

SHOCK THERAPY

During and immediately after the control of hemorrhage, the presence and degree of shock are determined and steps are taken to combat it at once. The patient is placed in "shock position," given morphine by the intramuscular or intravenous route, kept warm with blankets and carefully applied hot water bottles, and given plasma, blood or other fluids as may be indicated in his case. Oxygen therapy is also frequently of value in the treatment of these shocked patients.

After hemorrhage has been arrested, shock therapy started and the wound covered with a thoughtfully applied sterile dressing, the patient is carefully but rapidly examined. Wounded patients frequently have multiple injuries. Some may be obvious, as for example other open wounds, fractures of the extremities or multiple rib fractures with crushed chest. Others may be quite obscure, such as compression fracture of the spine, a traumatic rupture of the spleen, kidney or a hollow viscus in the absence of a penetrating wound, a fractured pelvis or a penetrating wound of the abdomen which first traverses the pleural cavity and diaphragm. Careful examination of wounded extremities is particularly necessary to determine the extent of injury to blood vessels, nerves, bones and tendons, as has been repeatedly emphasized by Koch [8] and Mason.[9] Such examinations when skilfully done take only a few minutes.

Additional information is gained from laboratory examinations, including the determination of the white blood cell count, differential count, red blood cell count, hematocrit and hemoglobin levels, and urinalysis. X-ray

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1. Reid, M. R., and Carter, B. N.: Treatment of Fresh Traumatic Wounds, Ann Surg. **114:** 4-18 (July) 1941. Stevenson and Reid.[10]

2. Koch, S. L.: Injuries of the Parietes and Extremities, Surg., Gynec. & Obst. **76:** 1-22 (Jan.), 189-196 (Feb.) 1943.

3. Miles, A. A., and others: Hospital Infection of War Wounds, Brit. M. J. **2:** 855 (Dec. 21), 895 (Dec. 28) 1940.

4. Hare, Ronald: Sources of Hemolytic Streptococcal Infection of Wounds in War and in Civil Life, Lancet **1:** 109-112 (Jan. 20) 1940. Hare, Ronald, and Willits, R. E.: Bacteriology of Recently Inflicted Wounds with Special Reference to Hemolytic Streptococci and Staphylococci, Canad. M. A. J. **46:** 23-30 (Jan.) 1942.

5. Colebrook, Leonard: Sulfanilamide and Wound Infections, Correspondence, Brit. M. J. **2:** 682 (Nov. 16) 1940.

6. Fleming, Alexander: Bacteriological Examination of Wounds, in Bailey, Hamilton: Surgery of Modern Warfare, Baltimore, William Wood & Co., 1941, vol. 1, chapter 16.

7. Altemeier, W. A.: Bacteriology of War Wounds: Collective Review, Internat. Abstr. Surg. **75:** 518-533, 1942, in Surg., Gynec. & Obst., December 1942. Altemeier, W. A., and Gibbs, E. W.: The Bacterial Flora of Contaminated Accidental Wounds, to be published.

8. Koch, S. L.: Treatment of Open Wounds, Bull. Am. Coll. Surgeons **25:** 176-178 (June) 1940; Injuries of the Parietes and Extremities.[2]

9. Mason, M. L.: The Surgical Principles Involved in the Treatment of Open Injuries, West. J. Surg. **45:** 239-248, 19

examinations are done only when the patient's general condition permits and usually are done on the way to the operating room.

A knowledge of the patient's general condition and the nature and extent of his multiple injuries is of great value in the definitive treatment of the wounds. It may indicate not only the safest type of anesthetic agent and the optimal time for operation but also the most practical and safest operative procedure for each case as compared with the ideal treatment. While the wounded patient is kept in the receiving ward until the operating room is ready and the patient's general condition warrants his transportation there, the institution of early general sulfonamide therapy by the intravenous administration of carefully calculated doses of sodium sulfadiazine may be of prophylactic value.

After removal of the patient to the operating room, shock therapy is continued for seriously injured persons by the intravenous drip administration of plasma, blood or other fluids as indicated, and the definitive wound treatment is begun. This treatment varies somewhat with different types of wounds, but for the purpose of illustration the operative care of a contaminated lacerated wound of less than six hours' duration containing devitalized and traumatized tissues will be given.

OPERATIVE CARE OF A CONTAMINATED WOUND

Such an operation is preferably done under general anesthesia. The operative field is prepared by the operator or his assistant, who scrubs up and puts on sterile gloves. The first aid or emergency sterile dressing is carefully removed, and another dry sterile gauze sponge is placed in the wound without overlapping the edges. The skin is then shaved and any grease, tar or other dirt adherent on the skin is removed with the aid of benzine or ether. The operative field up to the edges of the wound is then scrubbed thoroughly for at least ten minutes with cotton or gauze and plain white soap and water. The hand and foot are carefully cleansed and scrubbed when the wounds are near these structures. The skin is further cleansed with alcohol and ether and then painted with an antiseptic such as tincture of merthiolate, none of the alcohol, ether or antiseptic being permitted to enter the wound. If the wound is located on an extremity we prefer to perform the remainder of the operation under the pneumatic tourniquet applied after preliminary elevation of the extremity for three to five minutes. Gloves are then changed, and the wound is draped with sterile linen. The careful use of a tourniquet maintains a dry field, facilitating dissection, saves blood, reduces the amount of ligature material buried and eliminates frequent sponging of the wound.

At this clinic such wounds are not washed preoperatively and a "dry" débridement is routinely practiced, as previously described by Stevenson and Reid [10] and by Reid and Carter.[1] There is increasing evidence that wet débridement and prolonged washing increase the incidence of local infection.[11] An elliptic incision is made through the normal skin about ⅛ to ¼ inch from the wound edges and carried down into the subcutaneous tissues. Additional skin is never sacrificed needlessly. The skin flap is then undermined by careful sharp dissection and the incision continued to the underlying muscle fascia. The devitalized fascia and muscle are similarly excised preferably in one piece. In the case of many wounds which are deep and irregular and which directly involve essential structures such as tendons, joints, bone and major blood vessels or nerves that cannot be excised, the ideal excision of all devitalized tissue *en masse* is impossible. However, the excision of all dirty traumatized tissue must nevertheless be complete if serious infection is to be prevented.

Foreign material such as hair, particles of dirt, pieces of clothing or splinters of wood and stone are removed from the recesses of the wound along with the devitalized tissue. All excised tissue and foreign bodies are then placed in appropriate mediums for the isolation and identification of the contaminating bacteria. A small piece of traumatized muscle is always cultured under anaerobic conditions in milk medium for the rapid detection of Clostridium welchi (perfringens) [12] within five to ten hours.

After the mechanical cleansing of the wound is completed, the cavity is ready for irrigation. Large quantities of warm saline solution are slowly and gently poured into the wound from a level just above that of the wound. The cleansing is aided by the gentle rubbing of the raw wound surfaces with the gloved finger, which facilitates the floating away of small detached pieces of tissue and clotted blood as advocated by Reid.

During the operation any recognized vessels are clamped and ligated with fine black silk. If the procedure has been done under hemostasis produced by the tourniquet, the tourniquet is then released and any vessels still bleeding after the application of mild pressure by a warm saline sponge are clamped and ligated with fine silk, but no more ligatures are employed than necessary. The wound is again irrigated with warm saline solution and inspected for pieces of ischemic tissue. During the débridement it is obviously essential to preserve the blood supply not only to the wound but to the area distal to it.

At this point all instruments used in the primary phase of the operative procedure and which have been kept carefully isolated are discarded, the operating team puts on new gloves and gowns, and the wound is redraped in preparation for the repair of the injured structures.

PREVENTION OF INFECTION

In the secondary phase of the operative treatment of wounds, every effort is made to restore the injured structures to their normal position, continuity, function and appearance. To achieve this goal it is necessary to prevent the development of infection within the wound.

There is ample evidence that primary deep repair and closure of a wound is a safe and correct surgical procedure in civil practice if the débridement has been adequate, the time interval less than six hours, the blood supply sufficient and the approximation of tissues by sutures is possible without producing tension. In such a wound fine black silk is used throughout for the repair

10. Stevenson, Jean, and Reid, M. R.: Treatment of Traumatic Wounds, Am. J. Surg. **40**:442-449 (Dec.) 1939.
11. Meleney, F. L.: The Study of Infection in Contaminated Accidental Wounds, Compound Fractures and Burns, to be published.
12. Altemeier, W. A.: Rapid Indentification of Clostridium Welchii in Contaminated and Infected Wounds, to be published.

of tendons, nerves, fascia and skin. Only enough suture material is employed to hold in loose approximation live tissue to live tissue. If the closure is done under some tension, counterincisions may be made on either side for relaxation. The importance of avoiding repair by suture under tension is exceeded only by adequate débridement and preservation of local blood supply. If the primary closure is not possible without tension, the wound is either packed open with saline or petrolatum gauze or covered with a graft of intermediate thickness. There are other factors which make primary wound closure impossible, inexpedient or dangerous. Extensive loss of skin and other tissues as the result of injury or necessary débridement may make primary closure impossible. Wounds older than six to eight hours are usually already infected locally and should be left open for adequate postoperative drainage. Grossly contaminated wounds with considerable tissue damage, as for example those produced by land mine explosions or similar accidents, should never be closed regardless of their duration. In fact, if wound débridement is inadequate or compromised for any reason, primary closure is always dangerous.

The treatment described necessarily is varied for different types of wounds. In incised contaminated wounds of less than six to eight hours' duration in which the damage to tissue has been minimal, débridement is not required. After the wound edges and surrounding areas have been cleansed for ten minutes with white soap and water as described previously, the wound is carefully inspected. All foreign bodies, such as glass, are removed and the wound itself is then washed by gently irrigating it with warm isotonic solution of sodium chloride. When the cleansing is completed, the surrounding skin is dried and repainted with tincture of merthiolate solution. Gloves are changed and the wound is redraped. The wound is then repaired as necessary and closed with fine black silk.

The treatment of persons with small puncture wounds or through and through wounds of soft tissues not involving the peritoneal cavity caused by knife, gunshot, ice pick or other similar instruments is quite different. Such wounds warrant local treatment of the puncture wounds only, the remainder of the wound being undisturbed. The wounds and the surrounding skin are cleansed and draped and are then anesthetized with procaine hydrochloride infiltrated well away from the edges. Smooth stab wounds are washed superficially with isotonic solution of sodium chloride and closed by silk sutures without drainage. Gunshot wounds are excised through the skin and fat and washed with isotonic solution of sodium chloride. After cleansing, the wounds either may be left unsutured and covered with petrolatum gauze and a dry dressing or may be closed by black silk sutures through the skin and subcutaneous tissue. It is my opinion that such through and through gunshot wounds should be closed by suture after excision of the wounds of entrance and exit. During the past one and one-half years we have closed this type of wound in civil practice and have been impressed by the healing by first intention without evidence of infection. If such wounds are left open for the purpose of drainage in the event of infection, such drainage necessarily must be very incomplete and of little practical importance. The development of edema in the deeper muscles causes herniation of a portion of the muscle through the small hole in the fascia, effectively plugging it. This phenomenon was well known to the French surgeons during the first world war.

After the completion of the operative procedure it is important to dress the wound and extremity with several definite thoughts in mind. In the first place, sterile dressings properly applied greatly decrease the incidence of secondary wound contamination and infection. Secondly, healing is facilitated by the application of moderate and uniformly applied compression over the wounded area. The beneficial effects of compression have been repeatedly stressed by Blair,[13] Koch, Mason, Reid, Orr [14] and Trueta.[15] Thirdly, immobilization of injured soft parts by means of splints, casts, Schanz dressings or molds is just as important as that of bony parts. The importance of rest in the healing of wounds and in the prevention or treatment of infection cannot be overemphasized.

All wounded patients are given a prophylactic dose of tetanus antitoxin following a negative skin test immediately after operation. In the majority of instances a dose of 1,500 units is given, but in extensive dirty or infected wounds the dose is increased to 3,000 units. The latter dosage is given also to known diabetic patients.

In lacerated wounds containing traumatized muscle, a prophylactic dose of combined tetanus and gas gangrene antitoxin is usually administered. Although polyvalent gas gangrene antitoxin is effective in experimental gas gangrene, we have not been impressed by its prophylactic value clinically. We have learned to depend almost entirely on early and thorough surgical treatment for the prevention of gas gangrene. During the past eighteen months at the Cincinnati General Hospital we have treated 244 soft part and compound fracture wounds. Only 42 received the combined polyvalent antitoxin. The remainder received only tetanus antitoxin, even though the incidence of Cl. welchi contamination in these wounds was great. No frank cases of gas gangrene developed, although one small localized gas bacillus infection occurred thirteen days after injury. This responded readily to simple incision and drainage and daily local dressings with zinc peroxide.

It will be noticed that no mention has been made of local wound therapy with the sulfonamides. In an extensive and carefully controlled study of 1,500 wounds conducted under the direction of the subcommittee on Surgical Infections of the National Research Council, the local use of sulfonamides has not decreased the incidence of serious or trivial local infections in soft tissue wounds or compound fractures. We have participated in this study and our results at the Cincinnati General Hospital correspond with the collective report of the Subcommittee on Surgical Infections given by Meleney.[11] On the other hand, the general administration of sulfadiazine has apparently been of definite value in the treatment of patients with traumatic wounds. Although the incidence of local infection has not been decreased, the occurrence of spreading infection, of

13. Blair, V. P.: Influence of Mechanical Pressure on Wound Healing, Illinois M. J. **46**: 249-252 (Oct.) 1924.
14. Orr, H. W.: Treatment of Infected Wounds Without Sutures, Drainage Tubes, or Antiseptic Dressings, J. Bone & Joint Surg. **10**: 605-611 (July) 1928.
15. Trueta, Josep: Treatment of War Wounds and Fractures, New York, Paul B. Hoeber, Inc., 1940.

septicemia or of death due to infection is extremely low. The evidence is therefore strongly indicative that general sulfadiazine therapy minimizes invasive infection. For this reason it is our practice to administer systemic sulfadiazine therapy at the earliest opportunity and to continue it postoperatively. The dose is adjusted to the weight of the individual patient and a blood level between 6 and 10 mg. per hundred cubic centimeters is maintained for at least ten days. Daily sulfadiazine blood level determinations, red and white blood cell counts and urinalysis are used to control the administration of this drug.

The failure of the sulfonamides to prevent the development of wound infection reemphasizes the surgical truths that the physiologic state of the wound is of the greatest importance in determining the development of infection and that antiseptic or bacteriostatic agents have only transient antibacterial effects and may have definite harmful effects on the wounded tissues. It follows that chemotherapy in any form cannot and will not replace the surgical principles of débridement and asepsis.

To minimize secondary wound contamination and infection, we have adopted most of the steps in the dressing technic recently developed by Miles and his associates.[16] Dressings are done after a period of quiet of one hour or more. This permits most bacteria laden dust particles to settle again to the floor and minimizes air contamination of the wounds. Patients and personnel are masked just before and during the dressings to prevent contamination of the dressing cart and cross contamination of wounds. A two or three individual dressing team is used. In removing dressings it is important to cut the bandage and remove it in one piece. It is then placed at once in a closed metal container. Unwrapping of soiled bandages may charge the surrounding air with bacteria laden lint and dust particles capable of infecting adjacent wounds. The dressing procedure is performed with sterile instruments and dressings, and nothing is touched by the hands until the outer bandage is applied. Cleansing of the hands is done between dressings of contaminated wounds. Various implements used in treatment of open wounds such as arm or foot baths must be carefully sterilized to prevent cross infection of wounds. The use of tub baths is discouraged because of the inevitable contamination of the wound by the bacteria of the intestinal or genital flora.

Postoperatively the wounds are watched carefully for the development of infection, hematoma or other complications, although dressings are not done oftener than necessary. Wounds found to be contaminated by Cl. welchi by the rapid method of identification are watched very closely.[12] X-ray films are taken at least twice daily for soft tissue detail to facilitate the earliest possible diagnosis of incipient gas bacillus infection. Other local infections caused by the hemolytic streptococcus and hemolytic staphylococcus are picked up as early as possible to insure prompt treatment. A wound, however, is not dressed until there is a definite indication for doing so, and unnecessary dressings are eliminated as much as possible.

16. McKissock, Wylie; Wright, Joyce, and Miles, A. A.: Reduction of Hospital Infection of Wounds: Controlled Experiment, Brit. M. J. 2: 375-377 (Sept. 13) 1941.

MANAGEMENT OF INJURIES AND INFECTIONS OF THE UPPER EXTREMITIES

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The functional value of the human hand must be borne in mind constantly. Most of us show little concern about our upper extremity until we experience injury to or infection in some part of it. Practically every one has as his means of livelihood the ability to work with his hands. Mason [1] has aptly expressed this idea in his statement "Nature has developed in the hand a finely coordinated motor and sensory organ which has made possible our present civilization. The hand is composed of compact and efficiently balanced muscles, tendons and joints, motor and sensory nerves and specialized nerve endings. Bulk and protection are sacrificed to efficiency, there is nothing to spare, each part is reduced to a minimum."

INJURIES OF THE UPPER EXTREMITY

Except in rare instances, infections of the hand and forearm usually follow some injury, and therefore proper treatment of the open wound, whether it is large or small, is of paramount importance. The amount of material equipment needed for proper handling of the wound is small, but the knowledge and experience necessary are great.

The surgeon dealing with an open wound should put on a face mask and also cleanse his hands thoroughly before beginning the systematic examination of an injured extremity. It is important to examine the wound carefully as regards its nature and the extent of the trauma with special reference to damaged tendons, nerves or blood vessels. Only a systematic examination of the various muscles of the forearm in regard to their specific functions will determine the presence or absence of injury to a tendon. Furthermore, a careful examination of the motor and sensory function of the nerves of the forearm must be done. We regularly see patients in whom some major nerve had been severed and was not repaired at the primary operation. These observations suggest that some one neglected to do a careful neurologic examination, or the findings were misinterpreted. It is to be remembered that digital nerves are really important and, if injured, they always require repair. In final analysis the physical findings determine definitely what one may expect to encounter in the definitive treatment of the injury. Such wounds should never be probed, and blood vessels should not be haphazardly clamped and ligated. It is much better to control hemorrhage by pressure dressings during such an emergency than to clamp vital structures in a wound which is oozing and refilling with blood. Hemostatic control of bleeding and ligation of blood vessels should be done during final treatment of the injury.

In our "hand clinic," which is a part of the General Surgical Dispensary, a total of 532 "hand cases" have been observed, studied and followed during the eighteen month period from September 1941 to March 1943.

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1. Mason, Michael L.: Symposium on Surgical Infection: Infections of the Hand, S. Clin. North America 22: 455 (April) 1942

Of this group 306 cases were the result of injury and 226 were due to infection. Table 1 shows the injuries which were treated.

Lacerations.—Simple laceration of some part of the upper extremity, particularly the hand, is the injury most frequently seen. Our general policy in handling such an injury has already been outlined and the method of treating the wound is being discussed elsewhere in this symposium. It is to be remembered, however, that there is no excess tissue in the human hand. Therefore conservation of tissue is a principle which must be followed in the cleansing, débridement and suturing of such an injury.

Many of our cases were treated by the physicians in the admitting ward, some of whom had no previous experience in caring for simple wounds. For this reason infection did occur in many cases. Proper care of simple superficial lacerations of the upper extremity always proves to be worth while.

Tendon Injury.—By this injury is meant those cases which comprise either partial or complete severance of a tendon. Since this type of injury is seen frequently and since the results at best are none too good, only careful surgical repair should be attempted.

Several years ago many severed tendons were repaired in the admitting ward under poor surgical conditions. During the past three years practically all such cases have been repaired in the surgical operating rooms. Tenorrhaphy is almost always done under general anesthesia, silk being used for the suture material. For best results and whenever possible the operation should be done within three hours after the injury is sustained. After an interval of six hours it is questionable whether primary repair should be attempted.

In tenorrhaphy we have followed the technic advocated by Mason and Allen.[2] The operation is done in a bloodless field, bleeding being controlled by means of a pneumatic blood pressure cuff around the upper arm. The venous blood must be removed from the extremity by elevation of the part for five minutes or more. The pressure within the cuff should be above the systolic blood pressure.

Anatomic replacement of all surrounding tissue should be as complete as possible. We use a sterile aluminum splint to immobilize the forearm and hand in a functional position. Although the wound may be healed and all skin sutures removed, we do not advise motion of the part until fourteen days after the operation. At this time active motion is gradually started. The splint is used to protect the wound and the injured tendons. As more motion is applied the splint soon ceases to be a part of the treatment and is discarded. Squeezing a soft rubber ball in a large arm bath of soapy water stimulates more rapid return of function. Carefully directed physical therapy is helpful. We try to follow all tendon injuries until we are satisfied with the functional result.

Burns.—Burns of the upper extremity are common. Heat burns constitute the large proportion of these cases, although chemical and electrical burns are seen. Heat burns of the hand and forearm, regardless of their severity, respond exceedingly well to "primary cleansing, compression and rest" treatment. Details of this method have been described elsewhere in this symposium. In my opinion burns of the extremities respond better than similar burns elsewhere on the body.

2. Mason Michael L., and Allen, Harvey S.: The Rate of Healing of Tendons, Ann. Surg. **113**: 424-463 (Jan.) 1941.

Human Bite.—This injury is seen most frequently in the hand, although it may be seen elsewhere on the extremity. It is usually the result of a fist fight and hence the common site of injury is the dorsum of the metacarpophalangeal joint. At this point the extensor tendon is close to the surface and it is also easy for a tooth to penetrate the joint capsule and carry bacteria into the joint.

Experience leads me to believe that doctors, hospital residents and interns do not have enough respect for this injury. Many patients are examined in the admitting ward, given first aid, discharged and told to return if the wound does not heal. A human bite injury, if not treated properly at the time, will usually lead to serious infection. This is one of the most difficult infections to combat and in most instances leaves some permanent disability.

In the few instances in which we have been able to carry out correct surgical care early, the end results have been good. Only careful cleansing, débridement and repair will prevent serious complications. I believe that human bite injuries more than three hours old should be treated as open wounds. Since infection from human bite injury is frequent, the management of this

TABLE 1.—*Injuries of the Upper Extremities*

Type	No. of Cases	Per Cent
Lacerations	114	37.1
Tendon injuries	53	17.3
Burns	41	13.4
Human bites	31	10.1
Wringer injuries	30	9.8
Subungual hematomas	13	4.3
Nerve injuries	10	3.2
Foreign bodies	8	2.6
Dog bite	5	1.6
Frost bite	1	0.3
Total	306	100

complication is important. Splinting of the part is very important. Where cellulitis and edema are the prominent signs, massive warm boric acid dressings should be applied. We have found that the Vapo-therm is very useful to create moist heat in this type of injury. As soon as localization of the infection has occurred, the areas should be adequately opened. In most instances this means that the joint must be drained. The use of zinc peroxide as advocated by Meleney has in some instances helped to control the infection. Diluted solution of sodium hypochlorite is still one of the best agents to combat this mixed type of infection. Osteomyelitis usually develops in cases of pyarthrosis. There is no real indication for amputation of the part. We have had a few such patients develop useful fingers after this type of involvement.

Wringer Injuries.—Wringer injuries are not limited to people working in the laundry. This injury is seen quite frequently in children. Since the rollers of the wringer produce equal pressure on the two sides of the extremity the injury is usually limited to soft tissue and produces contusion and usually bleeding into the tissue spaces. Only rarely are fractures seen with this injury. Occasionally large avulsive lacerations complicate the injury. If there has been no loss of the skin flap, grafting is not necessary. After proper cleansing and débridement of the wound the flap may be replaced and held there by sutures. We have had excellent results

by placing the extremity on a sterile aluminum splint and applying a pressure dressing. Large hematomas of the dorsal subaponeurotic space respond well to this form of therapy. Aspiration is not usually indicated, but, if it is done, care should be used to prevent introduction of bacteria into the hematoma. Large avulsive wounds with loss of skin should be covered by split thickness grafts immediately if the patient's condition permits.

Subungual Hematoma.—This is an injury common to people using their hands, such as mechanics and carpenters. Although small collections of blood under the nail may cause considerable throbbing pain, no treatment need be instituted. Pain can usually be controlled by the ingestion of codeine and acetylsalicylic acid. When a large hematoma develops under the nail it is sometimes imperative to drill a small hole through the nail, cut out a triangular segment of nail, or in some instances remove the nail completely. These procedures should always be done under strict asepsis to prevent contamination of the nail bed.

Nerve Injuries.—Injuries to the radial, median or ulnar nerve trunks are always serious, whether the nerves are partially or completely severed. The first step in treating such an injury is to make the correct diagnosis. Neurorrhaphy performed by an experienced surgeon yields poor functional results in a great majority of cases. Careful cleansing and débridement of the wound is very important, since infection adds a complication which does not predispose to a good result. The cut ends of the nerve should always be mobilized and debrided when contused or torn. The perineurium should be approximated carefully so as not to suture nerve bundles. There is some disagreement as to whether many small interrupted sutures should be used or whether it is better to use fewer larger sutures. I have followed the principle of using three or four fine silk interrupted sutures and then approximating the perineurium between these with interrupted sutures of "cobweb" silk. Although neuromas have followed such a repair, many cases have progressed to a good functional result. It would seem from the many reports on nerve repair that neuromas will develop in a certain percentage of cases regardless of the method of repair which was used.

TABLE 2.—*Infections of the Upper Extremity*

Type	No. of Cases	Per Cent
Subepithelial abscesses	131	57.9
Paronychia	33	14.6
Felon	22	9.7
Subungual abscesses	20	8.8
Osteomyelitis	13	5.7
Tenosynovitis	7	3.0

The follow-up care after neurorrhaphy is very important. Intelligent splinting of paralyzed muscles has been emphasized by Koch. I believe that proper education of the individual in guidance and therapy over a period of many months is an important principle in rehabilitation of the involved extremity.

Foreign Bodies.—Small splinters usually offer no serious problem. However, steel, glass, needles and bullets are foreign bodies often not easy to remove. Many persons with foreign bodies seek medical attention hours, days and sometimes even weeks after the initial injury. In my experience one should not be too anxious to retrieve the foreign body too soon after the injury, since the operative procedure might excite infection. Roentgenograms will usually locate the foreign body and fluoroscopy in all planes will more adequately determine its position. We have been prone to remove all foreign bodies in the operating room and under general anesthesia unless contraindicated. Many times it would seem that recovery should be a simple matter and yet after spending several hours of operation the part may be seriously injured and the foreign body still not located.

Dog Bite.—Dog bites of the hand may be of either minor or major consequence. Usually this type of injury is superficial, and unless it is known that the dog is a "stray" there is no great cause for alarm. However, some dog bites are very deep and occasionally do considerable damage to the fingers, the hand and even the forearm. In this type of injury I believe that proper cleansing, débridement and repair is much more satisfactory than other forms of treatment. Tetanus antitoxin should always be given, but rabies treatment should be withheld until the exact status of the animal has been established. If the dog is a pet, then this phase can always be controlled. Injury from a strange dog is somewhat more complicated and perhaps immediate antirabies therapy should be begun.

Frost Bite.—Frost bite of the upper extremities is usually limited to the digits and is not commonly seen. When such patients seek medical attention immediately after the injury, slow elevation of temperature starting with ice cold water is the procedure of choice. The important part of therapy is the prevention of further injury of all physical agents, especially heat, and, secondly, to overcome the stagnation of blood in the peripheral tissues. Elevation of the part with light superficial massage is indicated and this, in addition to properly applied passive vascular exercise treatment, in the early phase of this disturbance of circulation, will materially aid in preventing serious sequelae by overcoming the venous stagnation.

When patients seek medical attention late, little can be done except to keep them comfortable and keep the traumatized areas clean. If local necrosis of tissue occurs it is wise to allow complete demarcation of the injured tissue before any amputation should be considered.

INFECTION OF THE UPPER EXTREMITY

It has already been pointed out that most infections seen in the upper extremity follow injuries. Only in rare instances are infections endogenous. Again I must repeat that the majority of infections of the hand might well have been prevented or the severity greatly reduced by early and proper treatment of the initial wounds.

When infection does occur it usually manifests itself as a specific type of infection and must be treated accordingly. In our clinic 226 cases of infections of the upper extremity were treated and studied from September 1941 to March 1943. Table 2 shows the common infections which were treated.

SUBEPITHELIAL ABSCESSES

The importance of intracutaneous and subcutaneous infections of the upper extremity lies in their frequency and the danger of being transformed into more serious complicating infections.

Intracutaneous infection is a lesion which we have noted frequently. A history of infection following a blister or a small abrasion with a rather rapid spread

in the skin itself is usually obtained. Occasionally the entire circumference of the finger is involved. The surface epithelium appears as a blister and, on opening this, one sees that the content is a thin watery discharge in which are scattered flakes of necrotic tissue. The basic epithelium appears red and edematous. This lesion is usually caused by the hemolytic Staphylococcus aureus. The treatment of the lesion confines itself essentially to removal of the entire blister and immediate application of sodium hypochlorite solution. We have tried moist and dry dressings, as well as other substances, with the invariable result that on subsequent dressings the infection has spread beyond the limits previously seen. If this infection is not brought under control it may give rise to deeper, more complicated infection.

Subcutaneous abscesses usually start from small wounds or pin pricks and may be caused by a multiplicity of organisms. This type of infection usually becomes well localized but may be associated with a certain degree of cellulitis. When the lesion occurs on a finger it may require careful observation and judgment to differentiate it from tenosynovitis, the most feared of all infections of the hand. Occasionally it may completely encircle the digits, in which case a differential diagnosis may be impossible. The treatment is based on an early accurate diagnosis and, when localized, early adequate drainage must be instituted. Occasionally this type of infection is seen about the distal phalanx and is confused with a paronychia.

Paronychia.—This lesion is frequently seen among doctors and nurses as well as hospital attendants. The infection usually begins in the marginal sulcus and as it progresses the edema on the marginal wall becomes apparent. This explains the common name of "run-around." This lesion is usually very painful and particularly uncomfortable at night because of the throbbing pain. The diagnosis is not difficult, and pressure on the nail usually elicits definite tenderness. I have found this point of examination very helpful in differentiating it from a subepithelial abscess in close proximity. Partial removal of the nail with oblique incisions from the base on either side or complete removal of the nail are the procedures of choice. We have used the one of complete removal of the nail because the type patient seen in our clinic many times is not too cooperative in returning for subsequent examination. When the nail is completely removed, no incisions are made. The nail bed is covered with petrolatum gauze and the dressing is not changed for three to four days. With the finger splinted, the infection is allowed to drain freely and rapid healing of the nail bed occurs. Complete nail regeneration usually occurs between two and three months after removal.

Felon.—This lesion is an infection in the distal phalanx, in which case the anatomic peculiarities explain the symptoms and course of the process. The connective tissue septums connect the volar surface of the skin of the tip of the finger to the bone. They hold the infection localized and, since extension is impossible, high pressure develops in this area. The distal phalanx becomes diffusely tense, and throbbing pain starts early in the course of the disease. The edema leads to impairment of the blood supply and, unless treatment is instituted early, necrosis of the distal end of the phalanx is to be expected. Osteomyelitis of the bone is not uncommon. As soon as the diagnosis of a felon is made, incision and drainage should be instituted. This should be done under general anesthesia. A lateral incision extending from the junction of the proximal and middle thirds of the distal phalanx to the tip of the finger and sweeping entirely across the pulp space to the skin of the opposite side is the procedure of choice. This cuts all the septums midway between the bone and the volar skin. Through and through and fishmouth incisions should be discouraged, since the former lead to unnecessary necrosis of tissue and the latter may yield a painful scar.

Subungual Abscesses.—A subungual abscess most frequently results from a foreign body under the nail. Careful histories reveal that the majority of patients attempted removal of it. I believe that infection starts primarily from this source and not from the injury created by the foreign body. In small subungual abscesses a V segment of the nail over the infection will usually promote adequate drainage. However, in large abscesses I believe it much wiser to remove the nail because necrosis of the nail bed may lead to osteomyelitis of the distal phalanx. This has happened in a small number of cases. Immediate treatment of the abscess with a solution of sodium hypochlorite will usually control the infection much more rapidly than any other substance.

Osteomyelitis.—This may occur in any part of the upper extremity. As a rule this type of infection is of exogenous origin when it involves the phalangeal and metacarpal bones, whereas in the other bones of the extremity it is usually of endogenous origin. In this discussion we are concerned with those cases of osteomyelitis which are complications of infections of the hand. This infection is frequently seen as a complication of human bite infection when there is an associated pyarthrosis. It may also be a complication of acute suppurative tenosynovitis. In many instances it is extremely difficult to diagnose and on final analysis is proved only by the presence of bone involvement as shown on the roentgenogram. We have utilized all the principles in the management of this infection as are applied to soft tissue lesions. As a complication with other infections the area should have adequate drainage and rest along with sterilization of the infected area. One must expect this lesion to persist for weeks. However, with proper care it should progress to healing. Too many surgeons amputate digits unnecessarily as soon as the bone shows involvement.

Tenosynovitis.—This is one of the most feared of all inflammatory processes. The function of the hand disappears rapidly with this lesion. It is fortunate, as shown in table 2, that the frequency of this type of infection in the hand is much less than others.

Usually acute suppurative tenosynovitis is the result of direct injury to the tendon sheath such as a cut or the injection of a piece of steel or wood followed by infection. The four cardinal signs of this infection are (1) diffuse swelling of the finger, (2) tenderness over the anatomic distribution of the tendon sheaths, (3) the finger held in slight flexion and (4) exquisite tenderness on attempting to move the fingers either actively or passively. In this instance one is dealing with pus in an enclosed space and, unless early surgical intervention promotes adequate drainage, the pressure built up within the sheath will cause spread of the infection.

Operation should always be done under general anesthesia, and adequate knowledge of the anatomy of the parts involved is essential to the surgeon. The finger should be opened on the lateral aspect in a bloodless

field, care being used never to cut the digital vessels or nerves or the transverse pulleys of the fingers. With this technic the tendon sheath is opened not only in the finger but also through a small transverse incision in the palm of the hand. If early drainage has been adequate and if tendon necrosis has not already started, many cases will respond well to therapy.

Complications from this infection may be fascial space abscesses of the hand, radial and ulnar bursitis, and a retroflexure space abscess. When these spaces become infected, adequate incision and drainage are again the only treatment of choice.

In this type of serious infection with or without many of its complications the patient needs adequate general therapeutic measures. These are bed rest, adequate oral or parenteral fluid intake, rest of the involved part, intelligent application of warm moist saline or boric acid dressings, utilization of small whole blood transfusions and, unless contraindicated, the systemic administration of sulfonamide drugs. With these principles in mind, better results will be obtained.

COMMENT

Injury practically always precedes infection, and therefore proper treatment of the initial injury constitutes good prophylactic surgery. If this principle were constantly kept in mind, less serious infections of the upper extremity would result and disability of working people would be shortened. As has been pointed out elsewhere,[3] it must be remembered that a good functional result should be the ideal goal and not just a nicely healed wound. This is the primary function of the Hand Clinic at the Cincinnati General Hospital.

MANAGEMENT OF COMPOUND FRACTURES

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When a patient receives a compound fracture the wound should be covered with sterile gauze and the limb should be splinted in order that movement made necessary by transportation will not disseminate or more deeply implant contaminating organisms. The classic description of the handling of his own case by Percival Pott is hard to improve on either as to method or as to excellence of descriptive English.

Before any local treatment of the wound is started, the patient should be thoroughly examined for evidence of severe shock or loss of blood. He should also receive a thorough physical survey for other injuries which are less evident than the compound fracture. Embarrassing experiences may occur from overlooking fractures of the clavicle, pelvis, cervical or lumbar vertebrae or ribs, and a condition which was interpreted as shock from the compound fracture may be due to a ruptured viscus, retroperitoneal or intraperitoneal hemorrhage or a contused or lacerated kidney. When it is certain that a patient is in shock, appropriate treatment should be instituted. Transfusions of whole blood meet most completely the requirements for loss of blood or shock. When a blood bank with whole blood is not available and a suitable donor is not at hand, the best substitute is plasma. Two to 4 pints may be given, and as soon as the patient reacts sufficiently to begin the treatment of the injury continuous slow intravenous infusion may be maintained.

The first treatment should have for its main purposes decontamination of the wound and arrest of hemorrhage. When the fracture has been compounded from within or by a gunshot wound it has become our custom to do no more than excise the skin margins, apply sterile dressings and reduce the fracture or immobilize it in the best obtainable position. Excessive bleeding or evidence of gross contamination are two complications which cause us to explore the wound and the site of the fracture more completely.

When the wound is large, is obviously contaminated and is bleeding freely or the fragments are extensively comminuted, exploration is required and this takes the form of complete débridement. It should not be necessary to emphasize that this is a formidable procedure and to be effective must be carefully and thoroughly done with the greatest care to stop all bleeding and handle all tissues with gentleness.

It is our custom to set up two instrument tables. The wound is packed with gauze and the skin is scrubbed with soap and water, shaved and then washed with alcohol and ether. The margins of the wound are then excised about the gauze packing, and the excision is carried deeper through any superficial devitalized or contaminated tissue. The entire excised mass of skin, subcutaneous tissue and gauze packing is then removed in a single mass, after which the wound is generously but gently flushed with salt solution. The first instrument table is then set aside, gloves and gowns are changed, the field is redraped and sterile towels are clipped to the wound margins. The wound is then thoroughly and systematically inspected and all tissue which shows evidence of soiling, severe bruising, infiltration with blood and any muscle which does not retract on cutting or pinching is excised. During this examination and excision, irrigation is repeated frequently; but scrubbing is very gently done and only with the gloved fingers. No scrubbing is done with gauze. Finally any soiled bone is removed with a sharp rongeur, and completely detached small fragments are removed. After final irrigation and complete hemostasis the wound may be closed or left open.

The ideal reduction and fixation can be obtained when the break is nearly transverse and the surfaces formed by the fracture are serrated to such a degree that they will engage and dovetail and remain in position without any need for foreign material to hold them in place. When this fortunate combination of conditions is present, the wound may be closed and the limb encased in plaster in a position of rest. Care must be observed to immobilize the adjacent joints in sufficient flexion to prevent the fragments from being displaced by rotation. Any movement of the fragments in tissue which still harbors bacteria may traumatize the tissue sufficiently to activate subsiding bacterial proliferation. On this account some form of rigid immobilization is desirable when they cannot be made to engage. One is by bolting, screwing or plating the fragments to one another so that all movement is stopped. The second method is by inserting multiple pins into the fragments above and below the fracture and clamping the protruding portion of these pins to a splint whose bars

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parallel the bone. Later the limb may be encased in plaster in which the pins are embedded and in this manner the bone is rigidly fixed to the plaster case.

The first method is objectionable because it is well known that a foreign body is not well tolerated when buried in contaminated or infected tissue. Much of this objection has been overcome by the use of metal fixation which is both chemically and electrolytically inert; also the local and parenteral use of the sulfonamides has had a beneficial effect in inhibiting bacterial growth, even when a foreign body is present. However, one should hesitate to embed a foreign body in a fracture when in doubt about the thoroughness and effectiveness of the débridement, when the débridement has been delayed, and when soiling and comminution are extensive. It is our custom to give a sulfonamide compound parenterally as soon as possible. We have not been convinced that local scattering through the wound of a sulfonamide is useful and believe that it may possibly be harmful by causing irritation and so reducing tissue resistance. Consequently we are awaiting the experience of others before adopting this possible further tissue insult.

If the fragments are to be held by multiple pins, these may be inserted and clamped before closing, or the pins may be inserted, the wound closed and the fragments then reduced and the pins clamped under fluoroscopic control. The first plan requires two crews and is troublesome, while the second generally necessitates the removal of an anesthetized patient to a fluoroscopic table and often leads to considerable disarrangement of the fragments.

After débridement of a compound fracture the preference is for closure of the wound. When this is done it should always be done loosely and never by layers. When closure without tension is not possible, relaxing incisions may be made at a distance in order to close the original wound, and the granulating areas left from these incisions are later covered with skin grafts. For immobilization we prefer plaster, applied without padding. Open wounds which cannot be closed are loosely packed with petrolatum gauze. When a compound fracture has had a complete débridement and has subsequently been encased in an unpadded cast, the cast is always split and the limb is inspected by x-rays for gas at least twice daily for the first two or three days.

All our patients with compound fractures receive combined tetanus and perfringens antitoxin on admission. They are given 3 Gm. of sulfadiazine at once and 1 Gm. every four hours afterward until a determination of the level shows 6 mg. per hundred cubic centimeters. A discovery of a predominance of streptococci in the wound should be followed by a change to sulfanilamide in which a level of 10 mg. per hundred cubic centimeters is the maximum level desired.

These methods have been followed with only slight personal variations for the past six years. Since the standardization of our débridement and insistence on details which we have come to believe as essential, we have had surprisingly few infections in compound fractures. On the other hand we have had good union and excellent functional results in many severe injuries which were badly contaminated.

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BACTERIOLOGY OF TRAUMATIC WOUNDS

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Recent wars have crystallized interest in the bacteriology of traumatic wounds. The literature which accumulated from the first world war alone was enormous. Because of the limited methods of cultivation and identification of bacteria in use then, many of these studies were not entirely satisfactory. However, they showed the frequency with which the anaerobic bacteria of gas gangrene could be cultivated from war wounds. As a result of the intensive study of Fleming, Wright, Henry, Weinberg and Sequin, and others, several fundamental concepts were developed. Wounds received in combat usually were grossly contaminated and all became infected if untreated. The organisms found in wounds were roughly divided into three groups: (1) sporulating microbes of fecal origin, (2) nonsporulating microbes of fecal origin and (3) pyogenic cocci. The first group consisted chiefly of gas producing bacteria, such as Clostridium welchi (perfringens), Clostridium oedematis maligni, Clostridium histolyticus, Clostridium sporogenes, Clostridium fallax, Clostridium tertius, Clostridium septicum and Clostridium tetani. Nonsporulating bacteria of fecal origin included the enterococci and bacteria of the colon-typhoid group. The third group of pyogenic cocci consisted chiefly of the staphylococcus and streptococcus. Nearly all war wounds contained these pyogenic cocci sooner or later.

Three phases in the bacterial flora of wounds were recognized by Fleming.[1] The primary stage of infection lasted approximately one week and was characterized by a dark reddish brown, foul smelling, watery discharge consisting of blood more or less altered by the growth of fecal bacteria. The sporulating anaerobes and streptococci were most commonly seen in this stage. The secondary phase showed a gradual transition between the primary anaerobic infection and infection with pyogenic cocci. During this transition the exudate became purulent and progressively less in amount. This stage lasted from two to three weeks and was followed by the tertiary phase characterized by the gradual disappearance of the fecal elements of the bacterial flora and by the persistence of simple pyogenic infection produced by staphylococci or streptococci.

Fleming also demonstrated that Cl. welchi was present in 81 per cent of the war wounds of from one to nine days' duration, in 34 per cent of the war wounds of from eight to twenty days, and in only 18 per cent of the wounds more than twenty days old. Staphylococci were found in practically all severe wounds in some stage of infection. Pseudomonas aeruginosa (Bacillus pyocyaneus), Proteus vulgaris and coliform bacilli may be found frequently in all stages of infection, but their pathogenicity is low although they have considerable nuisance value. Diphtheroid bacilli were present during the later stages but were seldom of importance. In addition the bacterial flora was found to be mixed, consisting of two or more bacteria in any of the stages.

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WOUND CONTAMINATION

Bacteria may be deposited in a fresh accidental wound at the time of its infliction and at any time afterward. After micro-organisms are carried into open wounds, a variable period of contamination exists during which the bacteria multiply in the devitalized and injured tissues, but the absorption of toxins is minimal and the invasion of the lymphatics surrounding the wound has not yet occurred. The interval of time that separates a contaminated from an infected wound represents the period of incubation for the bacteria present in the wound. Although the time varies with the virulence and rate of growth of the micro-organisms, it usually lasts from six to eight hours with an outside limit of twelve hours. Its duration is also dependent on other factors such as the location and nature of the wound, the general condition of the patient and the presence of systemic diseases, particularly diabetes. During the period of contamination, relatively few bacteria will be seen in a stained smear of the secretions from the wound.

Considerable difference in opinion has existed regarding the question of whether or not all traumatic wounds are contaminated by bacteria. Many reports indicate that negative cultures may be found in from 7 to 41 per cent of fresh accidental wounds, but an analysis of these studies shows that in the majority of instances the specimens cultured were obtained from swabs and not from debrided tissue. On the other hand, the reports of Sas,[2] of Pulaski, Meleney and Spaeth [3] and the report I [4] made indicate that all traumatic wounds are contaminated by bacteria.

During the period of contamination the more common types of organisms found in traumatic wounds include:

1. Staphylococci: hemolytic and nonhemolytic.
2. Streptococci: hemolytic, nonhemolytic, green producing, microaerophilic and anaerobic.
3. Enterobacilli: Escherichia coli, Proteus vulgaris, Eberthella, Shigella, B. alkaligenes, Pseudomonas aeruginosa, B. prodigiosus and others.
4. Clostridial bacteria: Clostridium perfringens, novyi, tetani, sporogenes, septicum and others.

If a traumatic wound has not received treatment for eight or more hours after its inception, particularly if it is grossly soiled, it may be considered infected. As infection succeeds contamination, bacteria extend beyond the wound edges, invasion of the lymphatics occurs, toxins are absorbed and the patient becomes ill.

The most serious infections occurring in traumatic wounds are tetanus, gas gangrene and pyogenic infections. Other less common lesions complicating wounds listed by Cruikshank [5] are wound diphtheria, "Meleney's" ulcerations and infections caused by anaerobic streptococci and anaerobic gram negative bacilli. Infections with anaerobes show a high mortality rate but a shorter period of danger of life, unless the anaerobes are in association with a hemolytic streptococcus. Clostridial bacteria play the most important part in primary infection of war and extensive civil wounds. In general their pathogenicity is low unless they are placed in a wound containing devitalized tissue. Gas gangrene and tetanus are prone to occur during this stage. The primary infection disappears at variable rates in different wounds, depending on the severity of the wound and presence of sloughs, sequestrums or foreign bodies. It is gradually replaced, often during the second week, by the stage of secondary infection caused chiefly by the pyogenic cocci, especially the hemolytic Staphylococcus aureus and Streptococcus hemolyticus and to a lesser extent by P. aeruginosa, E. coli and Proteus vulgaris.

SOURCES OF BACTERIA

Primary Infection.—The most important sources of the bacteria producing primary contamination and infection are soil, clothing, skin, hair and various other foreign bodies including wood, metal or stone splinters. The great number and variety of bacteria of fecal origin in soil, especially when it has been highly fertilized and cultivated, is well known. Zeissler [6] has pointed out that the incidence of the various causal organisms of gas gangrene in the soils of different battlefields is established. Wan [7] has estimated that the number of Cl. perfringens spores in cultivated and polluted soils may reach 10,000 per gram of soil. We have examined dirt from many of our major street intersections in Cincinnati and found spores of Cl. perfringens almost invariably present.

Until recently it was thought that the presence of gas gangrene bacteria on the clothing and skin of a civilian or soldier was dependent on contamination by soil or feces. Gage [8] and Maes [9] have pointed out an additional explanation for bacterial contamination of wounds by clothing. All domestic animals, especially sheep, harbor anaerobic micro-organisms, and clothing made from wool is naturally contaminated by Cl. perfringens and other anaerobic gas producing bacteria. In 25 pieces of woolen cloth cultured recently I [4] found Cl. perfringens in 23.

Bacteria resident on the patient's skin or hair may be carried into the deeper recesses of a wound. The integument normally has a resident bacterial flora composed usually of staphylococci but occasionally of streptococci, coliform bacteria and sporulating anaerobic bacteria. It has been pointed out by Hirshfeld [10] that the gentle agitation of eyebrows over an open Petri dish of blood agar will result in the growth of from 2 to 100 colonies of staphylococci. Price [11] has shown that when the skin is constantly exposed to certain bacteria they may become part of the resident flora. Gillespie, Devenish and Cowan [12] found virulent strains of staphylococci in the cutaneous bacterial flora of 19.5 per cent of 159 medical students.

Secondary Infection.—The sources of the very important secondary contamination and infection of wounds include the (1) respiratory tract of the patient or any one treating or observing the wound, (2)

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3. Pulaski, E. J.; Meleney, F. L., and Spaeth, W. L. C.: Bacterial Flora of Acute Traumatic Wounds, Surg., Gynec. & Obst. **72**: 982-988 (June) 1941.
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10. Hirshfeld, J. W.: Bacterial Contamination of Wounds from Air, from Skin of Operator and from Skin of Patient, Surg., Gynec. & Obst. **73**: 72-78 (July) 1941.
11. Price, P. B.: Bacteriology of Normal Skin: New Quantitative Test Applied to Study of Bacterial Flora and Disinfectant Action of Mechanical Cleansing, J. Infect. Dis. **63**: 301-318 (Nov.-Dec.) 1938.
12. Gillespie, E. H.; Devenish, E. A., and Cowan, S. T.: Pathogenic Staphylococci: Their Incidence in Nose and on Skin, Lancet **2**: 870-873 (Oct. 21) 1939.

unsterile dressings, (3) the skin of any one touching the wound, (4) dust of the operating room or hospital ward and (5) contaminated dressings, instruments or utensils. The discharge from infected wounds such as burns, open draining wounds or fecal fistulas may contaminate the dressings, clothing and bedding, and manipulations of these may charge the air with bacteria laden particles of lint, dust, epithelium or dried exudate. Exposed wounds thus become repeatedly inoculated with these bacteria. Another method of cross infection of wounds within hospitals is found in the bathing of wounds in tubs, arm baths or foot baths that have been either inadequately sterilized or not sterilized at all.

Hare [13] and Fleming [14] believe that the hemolytic streptococcus is the most important agent in secondary infection, although it has been our experience at the Cincinnati General Hospital that the hemolytic Staphylococcus aureus is more important. Contamination of fresh accidental wounds with the hemolytic Staphylococcus aureus had already occurred in 35 per cent of the cases by the time débridement was done. This bacterium was introduced into the wound possibly at the time of injury but more probably at some later time during the administration of first aid, the transportation of the patient to the hospital or his examination or observation in the receiving ward prior to operation. In a few instances these organisms may come from the patient's own skin, but usually they are introduced into the wound by faulty technic of dressing, droplet contamination from an infected or carrier attendant or from infectious dust or bed clothing. It is interesting to recall that Lord Lister laid great stress on air borne infections, but until very recently their importance has been underestimated. It must be remembered that the hemolytic streptococcus can remain viable for a considerable length of time in dust, and that when blankets and bedding are shaken or the floor is swept these bacteria go into the air and become a potential source of infection. Unless very strict precautions are taken, secondary or cross infections are bound to occur in a surgical ward.

In previous wars as well as in time of peace, the spread of P. aeruginosa through a crowded hospital surgical ward was well known and was easily recognized by the green or greenish blue discoloration of the dressings. This phenomenon is of great importance since it is a visible indication of flaws in surgical technic and it would be probably easier to establish growth of a greater pathogen than P. aeruginosa such as the hemolytic streptococcus or the hemolytic staphylococcus.

Although it was known in the first world war that the incidence of hemolytic streptococcus infection of wounds increased with the age of the wound, the work of Miles and others,[15] of Hare and Willits [16] and of Fleming [14] has clearly explained the mechanism and extent of secondary contamination. According to a recent *Lancet* editorial [17] secondary infection occurred in only 5 per cent of the open wounds on admission to the hospital, in 50 per cent after one week's hospitalization and in from 70 to 80 per cent later on.

The hemolytic streptococci have been grouped serologically by Lancefield [18] and approximately 90 per cent of the pathogenic strains occur in group A. It is also possible to group the great majority of pathogenic hemolytic staphylococci by their ability to coagulate human plasma by means of the coagulase test.

To overcome the dangers and results of secondary contamination and infection, McKissock, Wright and Miles [19] developed a new dressing technic designed to prevent the mechanical transfer of infected material from one wound to another and the contamination of wounds by droplet or air dust. With this method of dressing wounds they reduced secondary infection of war wounds from 31.3 per cent to 2.2 per cent. The application of various oily substances to blankets, sheets and floors has been recommended to reduce the production of dust. The early application of a sterile dressing to a wound as a first aid measure is advised, but touching the wound with unsterile dressings, fingers or other soiled objects is distinctly discouraged.

Factors Influencing Wound Infection.—The factors which determine the development and character of infection include (1) the virulence, types and number of contaminating bacteria, (2) the nature, location and duration of the wound, (3) the presence of foreign bodies, (4) the general condition of the patient, (5) the immunity response of the individual and (6) the type and thoroughness of treatment.

The presence of virulent strains of such bacteria as Cl. perfringens, Cl. septicum, Cl. oedematis maligni, Cl. histolyticus, Cl. tetani, hemolytic streptococci and hemolytic staphylococci in a wound furnishes the agents of infection. It must be remembered, however, that the mere presence of virulent bacteria in a wound does not make infection of that wound a certainty. Cl. perfringens has been found consistently in one third of our major wounds in the Cincinnati General Hospital [20] at the time of débridement, yet the development of gas gangrene in such cases is extremely infrequent. The evidence indicates that the physiologic state of the tissues within the wound before and after treatment is more important than the presence of bacteria per se, although the degree of soiling, the amount of tissue damage and the number of contaminating bacteria have long been known to increase the probability and severity of wound infection. The synergistic or cumulative action of the bacteria present may also determine to a large extent the nature and severity of the infection.

We agree with Bisgard and Baker [21] that no method of treatment in use today renders a contaminated wound absolutely free from bacteria. Under such conditions the development of infection would be dependent largely on the number and virulence of the organisms remaining in the tissues and the amounts of devitalized tissue or other foreign bodies available for bacterial nutrient mediums. The enhancement of infection by the presence of a bullet retained in a wound of the soft parts or even a compound fracture does not mean that this foreign body will always cause infection, since it is every one's experience in civil practice that such wounds may heal promptly and without evidence of infection. It must be

13. Hare, Ronald: Sources of Hemolytic Streptococcal Infection of Wounds in War and in Civil Life, Lancet **1**: 109-112 (Jan. 20) 1940.
14. Fleming, Alexander: Bacteriological Examination of Wounds, in Bailey, H.: Surgery of Modern Warfare, Baltimore, William Wood & Company, 1941, vol. 1, chap. 16.
15. Miles, A. A., and others: Hospital Infection of War Wounds, Brit. M. J. **2**: 855 (Dec. 21); 895 (Dec. 28) 1940.
16. Hare, Ronald, and Willits, R. E.: Bacteriology of Recently Inflicted Wounds with Special Reference to Hemolytic Streptococci and Staphylococci, Canad. M. A. J. **46**: 23-30 (Jan.) 1942.
17. The Ward Dressing, editorial, Lancet **2**: 565 (Nov. 8) 1941.
18. Lancefield, R. C., and Hare, Ronald: Serological Differentiation of Pathogenic Strains of Hemolytic Streptococci from Parturient Women, J. Exper. Med. **61**: 335-349 (March) 1935.
19. McKissock, Wylie; Wright, Joyce, and Miles, A. A.: Reduction of Hospital Infection of Wounds: Controlled Experiment, Brit. M. J. **2**: 375-377 (Sept. 13) 1941.
20. Altemeier, W. A.: The Incidence of Clostridium Welchii in Fresh Traumatic Wounds, Tr. West. S. A. (1941) **51**: 110-125, 1942.
21. Bisgard, J. D., and Baker, C. P.: Treatment of Fresh Traumatic and Contaminated Surgical Wounds, Am. J. Surg. **55**: 386-396 (Feb.) 1942.

remembered that suture material buried within a wound may act as a foreign body and must therefore be used intelligently, just enough being employed to approximate live tissues and obliterate "dead pocket" as much as possible. In the case of contaminated abdominal wounds we believe that the foreign body effect of buried suture material can be completely eliminated by the through and through silver wire closure as described by Reid and Zinninger.[22]

The type of wound is a very important determining factor in infection. Extensive wounds containing large amounts of devitalized tissues, especially muscle, fascia and bone, furnish excellent culture mediums in which contaminating bacteria may develop and infect the wound. Wounds of the thigh or buttocks may severely damage a pound or more of muscle, and these greatly devitalized masses may show the phenomenon of gas gangrene in its most obvious form. On the other hand, through and through bullet wounds not perforating the lumen of organs containing bacteria such as those of the respiratory or gastrointestinal tract rarely become infected and usually heal spontaneously. During the past two years it has been our policy to excise the point of entrance and exit of such wounds and close them by suture. Almost without exception, prompt healing without infection occurred.

The multiplicity of severe wounds in one person may so compromise the treatment that adequate débridement of one or more of the wounds is not possible. Because of associated severe shock, hemorrhage, head wound or chest injury, the local treatment of wounds necessarily assumes a minor role to the general treatment of the patient. If the period of time required for the successful general treatment exceeds six to eight hours, infection will have occurred before local definitive treatment can be started.

"Time lag," the period between infliction of the wound and surgical therapy, is usually less than six hours in civil practice. It is imperative that adequate débridement be done during the first six to eight hours, the so-called golden period, if infection is to be prevented. When the "time lag" exceeds six to eight hours and certainly twelve hours, infection automatically succeeds contamination and thorough débridement is no longer possible.

Impairment of the local blood supply by damage or ligation of large vessels, by displaced fractures, by pressure of hematomas, by tourniquets or ill applied and fitting casts or by increased subfascial tension due to edema, hemorrhage or sutures favors the development of infection.

The location of the wound is an important factor in the development of infection. Not only are the various tissues known to have different powers of local resistance to infection, but the resistance of these tissues also varies with their location in the body. Lacerations of the face and neck are prone to heal kindly unless they are in communication with the mouth and pharynx. The face, scalp, back and thorax are affected but rarely by gas gangrene, while the muscular areas of the thigh, calf and buttocks are particularly prone to develop gas bacillus infection.

The symbiosis of aerobes and anaerobes may favor the multiplication of the bacteria of gas gangrene and putrefaction. Whether an infection once implanted remains localized, spreads extensively or invades the blood stream is dependent on such factors as the nature of the wounded tissue, the virulence and dose of contaminating bacteria and the resistance of the host.

The physical condition of the patient at the time of the injury may also play an important part in the development of infection. His general powers of resistance may have been reduced by shock, fatigue, exposure, continued pain, hunger, malnutrition, thirst and loss of blood.

Finally the type and thoroughness of treatment instituted play a great part in determining whether or not a wound will become infected. This subject will be taken up in detail in another article.

The local and general use of the sulfonamides has been found to be of only limited value in the prevention and control of infection in traumatic wounds. In the carefully planned and executed study of wounds conducted during the past one and one-half years by the Committee on Surgical Infections under the auspices of the National Research Council,[23] the local and general use of sulfonamides in soft tissue and compound fracture wounds has failed to decrease the incidence of serious or trivial infection. It has seemed to help in the localization of any infection that may develop in the wound. On the other hand the local use of sulfanilamide and the general use of sulfadiazine have been of great value in the prevention and control of infection complicating penetrating wounds of the abdomen, chest and central nervous system. It remains to be seen whether the prophylactic use of penicillin or allied agents will decrease the incidence of local wound infection.

SUMMARY

The bacterial flora of traumatic wounds has been found to consist of a variety of organisms, roughly falling into two groups: (1) fecal bacteria and (2) progenic bacteria. The bacteria of fecal origin include aerobic forms such as enterobacilli and enterococci, as well as anaerobic forms such as Cl. tetani, Cl. perfringens and Cl. novyi, Cl. septicum and other spore formers associated with gas gangrene. The pyogenic group consists of staphylococci, streptococci, microaerophilic streptococci and anaerobic streptococci.

When the wound is first seen by the surgeon and throughout the first week the flora of war wounds consists principally of the bacteria of fecal origin introduced into the wound along with soil, skin, hair, clothing or other foreign bodies. It is during this period that gas gangrene and tetanus are apt to develop. During the second week in open wounds the fecal organisms are gradually replaced by the staphylococcus, streptococcus and P. aeruginosa. The sources of these pyogenic bacteria are extremely interesting since the evidence indicates that they are principally of human origin and that in the great majority of instances they are introduced into wounds some time after injury, particularly during the period of hospitalization.

To minimize this secondary infection, various procedures have been devised, including early application of sterile first aid dressing without probing of the wound, masking of both the patient and the medical personnel during dressings, the use of oil on ward floors to eliminate dust during sweeping, and careful aseptic dressing technic designed to prevent the mechanical transfer of pyogenic infection from one wound to another, as well as dust and air droplet contamination.

22. Reid, M. R.; Zinninger, M. M., and Merrell, Paul: Closure of Abdomen with Through and Through Silver Wire Sutures in Cases of Acute Abdominal Emergencies, Ann. Surg. **98**: 890-896 (Nov.) 1933.

23. Meleney, F. L.: The Study of Infection in Contaminated Accidental Wounds, Compound Fractures and Burns, to be published.

The factors important in determining the development of infection include the virulent type of contaminating bacteria, the nature, duration and location of the wound, the presence of foreign bodies, the general condition of the patient and the type and thoroughness of treatment.

To prevent primary infection of the wound, débridement has replaced the use of wound disinfectants. The success of primary débridement is dependent on the observation of well known principles of surgical therapy: (1) removal of all foreign bodies and devitalized tissue within the first six or eight hours, (2) suture of tissues without tension and with a minimum amount of buried ligatures and sutures, (3) maintenance of an adequate blood supply and (4) apposition of live tissue to live tissue for the promotion of healing.

The local and general use of sulfanilamide and other chemotherapeutic agents has so far failed to decrease the incidence of local infection in soft tissue wounds. The general administration of the sulfonamides, particularly sulfadiazine, to wounded patients is indicated for its localizing action on any developing infection, its prevention of septicemia and its prevention or attenuation of postoperative pneumonia. The type of treatment, the time of its institution and the skill of its administrator largely determine the effective prevention of wound infection.

THE MANAGEMENT OF WOUNDS AND INJURIES OF THE HEAD

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The importance of injuries of the head rests chiefly in the damage that may be done either directly or indirectly to the brain, and it is with this problem that the surgeon is chiefly concerned. At the risk of oversimplification, the subject may be divided into four main sections: injuries to the scalp, injuries to the cranium, meningeal hemorrhage, and physiologic and anatomic damage to the brain itself, either primary or secondary to disturbances in any one or more of the other divisions.

SCALP INJURIES

The scalp is made up of skin, subcutaneous tissue, aponeurosis and an underlying layer of loose areolar tissue which divides the aponeurosis from the periosteum of the skull. The aponeurosis forms a subaponeurotic compartment and is usually an effective barrier against infection. Once, however, infection has penetrated through the aponeurosis there arise two possibilities: a widespread subaponeurotic infection, and involvement of the periosteum and the underlying bone. It must also be borne in mind that penetrating vessels descend from the scalp through the diploic channels of the bone into the leptomeninges. Another point of anatomic importance is the great vascularity of the scalp, which is abundantly supplied with vessels coursing through the subcuticular layer. Thus, though uncontrolled bleeding from the scalp may lead to exsanguination, it must also be recognized that this abundant vascularity favors healing of the scalp, even under unfavorable circumstances.

Injuries to the scalp may consist of simple lacerations, widespread contusions from injury with blunt objects, or avulsions of the scalp with and without loss of the periosteum.

Treatment consists in thorough cleansing of the wound and débridement. The first step in cleansing is a wide, close shave followed by thorough irrigation of the laceration with sterile isotonic solution of sodium chloride, following which the prepared area with the exception of the wound itself should be freely painted with merthiolate or other acceptable antiseptic. The region may then be locally blocked with anesthetic solution (1 per cent procaine). If the wound is a clean laceration, no débridement is necessary. However, any devitalized tissue which may be present should be debrided widely.[1] If the periosteum is soiled, this must also be removed, following which the entire area should again be washed thoroughly but gently with a quantity of isotonic solution of sodium chloride, so that mechanical cleansing is accomplished.

If the wound is of recent infliction and time is available, it is quite permissible to bury silk sutures in the aponeurotic layer. In this fashion a less evident scar is obtained. On the other hand, a through and through closure with interrupted silk sutures or with dermal suture material is acceptable.

In those instances in which a large quantity of scalp tissue has been lost, it may be necessary to undermine the aponeurosis and shift scalp substance. Sometimes even counterincision is required. The scalp will stand a rather surprising degree of tension, and in some instances wounds which appear to be closed unusually tightly will heal satisfactorily. If the periosteum has been left intact, it is permissible either to shift a pedicle graft at the time or to take Thiersch grafts for the covering of wide areas of denuded scalp.

Drainage is usually unnecessary if the wound is not more than six hours old. If more than twelve hours old it is probably wise to use a small rubber tissue drain inserted through a separate stab opening. A dry dressing may then be applied and fixed in place either with collodion or with liquid adhesive. If the wound is extensive or if there are multiple wounds, it may be wiser to apply a large head dressing.

Wounds which have not been subjected to this treatment and which are infected must be widely opened, and subaponeurotic abscesses may require very extensive multiple drainage.

In clean wounds the use of sulfanilamide should not be necessary in civilian practice. In those occasional instances in which it may be anticipated that there will be extensive delay before closure can be accomplished, dusting of the wound with sulfanilamide would seem to be a wise procedure.

CRANIAL INJURIES

The malleability of the skull in younger persons is an important point to bear in mind in evaluating the severity of head injuries in children. Egg shell and stellate fractures appear to be more frequent than in adults, in whom the inner and outer tables are relatively thick and rigid. Other anatomic points of importance are the presence of air sinuses, which make their appearance during early childhood, the presence of various important foramens through which pass major vessels and cranial nerves, and the presence of large venous sinuses closely affixed to the skull by virtue of the fact that the outer layer of the dura comprises the inner layer or the periosteum of the skull.

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1. Altemeier, W. A.: The Treatment of Fresh Traumatic Wounds, this issue, p. 0000.

Injuries to the bone may be of several types: simple fractures, comminutions, depressed fractures and compound fractures made up of the three previous types. The recognition of the various types depends chiefly on x-ray studies, though percussion may sometimes give a clue to the presence of fracture. Palpation in closed wounds may oftentimes be misleading because of the heaping up of the aponeurosis, which makes the adjacent areas seem depressed. In compound wounds palpation with a gloved finger may be permissible, but this should be carried out by the person who is going to assume responsibility for immediate definitive treatment.

Treatment of simple and comminuted fractures is not required for the fractures per se. Depressed fractures require elevation; this is particularly true of those which lie over large vascular channels or over the sensorimotor cortex, in the latter instance because of the possibility of serving as an irritative agent responsible for later convulsive seizures. At times rather nice judgment may be required to decide whether a depression is of sufficient extent to require elevation. More extensive fractures, of course, which compromise the capacity of the intracranial chamber must be lifted.

Treatment of compound wounds with underlying simple fracture is essentially that of the treatment of scalp wounds, but when depressed fragments lie underneath these must be elevated. If the dura is not torn, the problem is relatively simple. If there are associated lacerations of the brain, débridement of the cerebral tissue may be necessary, a point which will be discussed in a later section.

MENINGEAL BLEEDING

The dura is very closely apposed to the undersurface of the skull, and it is within the outer layer of the dura that the meningeal vessels run. It is generally true that the bleeding which occurs in the extradural space is of meningeal origin, bleeding usually being from the middle meningeal artery. There is evidence, however, that a somewhat slower type of extradural accumulation of blood may occur when the major venous sinuses are lacerated and blood has the opportunity to make its way out into the extradural space.[2] The subdural space, on the other hand, is not merely a potential but an actual space which contains a small amount of fluid of high protein content at all times, this fluid probably serving as a lubricating medium for the brain within the skull case. Blood which makes its way out into the subdural space has no means of egress and it serves as a foreign body which, if present long enough, becomes encapsulated by a barrier of connective tissue thrown up from the inner surface of the dura.[3] The inner portion of the capsule is made up of similar fibrous tissue, which may be derived from the arachnoid rather than from the dura. The larger cortical veins, when leaving the surface of the brain to enter the median longitudinal sinus, traverse the subdural space. In so doing they travel unsupported through the space for a distance sometimes as great as 2 cm. Movements of the brain within the dural envelope, which is firmly attached to the skull, may result in tearing of these thin walled vessels. It is usually from such vessels as these that subdural accumulations of blood occur,[4] though sometimes they are secondary to laceration of the brain with tearing of the arachnoid and outpouring of blood through the arachnoid into the subdural space.

From the practical point of view of the treatment of head injuries, blood which is present in the subarachnoid space does not require consideration here, because of the fact that the subarachnoid space is relatively narrow and is filled with arachnoidal trabeculations which make surgical drainage not feasible. Moreover, the endothelial cells which line the subarachnoid spaces very rapidly become mobilized and serve as phagocytes which break down the blood and dispose of it more effectively than could otherwise be accomplished.[5]

Therefore one is concerned surgically with epidural and subdural bleeding. The classic diagnostic picture of epidural hemorrhage occurs in a person who, following the receipt of a head injury, has a period of clarity which is gradually followed by the onset of a deepening level of coma, secondary to compression of the brain. A "hemispheral" weakness develops which classically is supposed to appear first in the face, then spread to the arm and leg of the opposite side. The ipsilateral pupil is then described as dilating as the result of stretching of the third nerve. Actually this classic picture may be seen rather rarely. From the practical point of view differentiation between epidural and subdural hemorrhage is unnecessary. The essential points to bear in mind are that an accumulation of blood over one hemisphere results in compression of the brain and deepening coma, and dysfunction of the hemisphere which is manifested chiefly by pareses of varying degrees. In some instances dysfunction of the speech mechanism with resultant dysphasia may be the only localizing sign. In other instances a homonymous hemianopsia may indicate compression of an occipital lobe. There is no rule of thumb for treatment of head injuries, but the closest approach to such a rule is that "localization necessitates operation." Hence, given a patient with a history of head injury, the development of such signs warrants a consideration of the diagnosis of epidural or subdural hematoma. Localized headache may also be of help. If lumbar puncture indicates an increased intracranial pressure, whether the fluid is bloody or not, one has additional evidence in favor of the diagnosis. Occasionally it is possible to detect in a true anteroposterior view of the skull a displaced, calcified pineal gland.[6] This sign, when present, may be of considerable help in arriving at a decision. Usually bleeding into the extradural space is rapid, since the blood is generally derived from the middle meningeal artery. Per contra, bleeding into the subdural space is generally manifested by the slow development of signs and symptoms because the bleeding is usually of venous origin. However, neither rule is absolute.

From the practical point of view the necessity of differentiating preoperatively between epidural and subdural bleeding is not a matter of great moment but rather is an academic matter. This is true because the treatment in the two instances is the same. Blood present in either space is a foreign body and is acting as a compressing mechanism and must therefore be evacuated. Epidural bleeding generally manifests itself

2. Munro, Donald, and Maltby, G. L.: Extradural Hemorrhage: Study of Forty-Four Cases, Ann. Surg. **113**: 192 (Feb.) 1941.
3. Munro, Donald, and Merritt, H. H.: Surgical Pathology of Subdural Hematoma Based on Study of One Hundred and Five Cases, Arch. Neurol. & Psychiat. **35**: 64 (Jan.) 1936.
4. Leary, Timothy: Subdural Hemorrhages, J. A. M. A. **103**: 897 (Sept. 23) 1934.
5. Sprong, Wilbur: Disappearance of Blood from Cerebrospinal Fluid in Traumatic Subarachnoid Hemorrhage: Ineffectiveness of Repeated Lumbar Punctures, Surg., Gynec. & Obst. **58**: 705 (April) 1934.
6. Naffziger, H. C.: Method for Localization of Brain Tumors—the Pineal Shift, Surg., Gynec. & Obst. **40**: 481 (April) 1925.

fairly definitely within a matter of a few hours or at most several days. An acute subdural hemorrhage may be difficult to differentiate from it. In either instance treatment of choice in my opinion is the making of bilateral subtemporal exploratory openings. These may

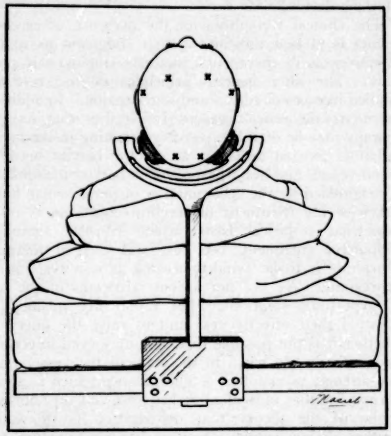

Fig. 1.—Support of the head on the rest devised by Dr. Richard Light. The head of the table may be raised to facilitate approach to the occipital region.

generally be placed under local anesthesia; a linear incision is made in the skin just anterior to the tip of the ear in the direction of the inferiorly lying fibers of the temporal muscle. Care must be taken not to lose excessive blood from the temporal artery. The temporal muscle is split, the fibers are retracted, and with a perforator and burr an opening is made in the squamous portion of the temporal bone. If epidural bleeding is immediately met, the opening must be quickly enlarged to about the size of a silver dollar (38 mm.) and with suction and the brain spoon it is usually possible to evacuate without too much difficulty the extradural accumulation. The bleeding arterial points must then be controlled either with silver clips or by use of the electrocautery. Generally the exposure of the area is relatively simple because the clot has already dissected the dura away from the bone and there may be actually an abundance of room in which to work, so that the exposure of the foramen spinosum, the point of entry of the middle meningeal artery, may be a relatively simple matter. All bleeding points must be carefully located. Thereafter it may seem wise to open the dura in search of further bleeding in the subdural space. In any event, if no extradural bleeding has been found the dura must be opened and the subdural space explored. Acute bleeding in the subdural space is usually fluid, probably for two reasons, mixing with the cerebrospinal fluid of varying degrees and, secondly, because the flagellating effect of brain pulsations causes defibrination of the slowly escaping blood. If this is the case, drainage is usually accomplished with relative ease. Occasionally a subdural accumulation of blood may be solid clot and it may prove difficult to evacuate it, even through a fair sized subtemporal opening. In these instances recourse may be had to the turning of a bone flap.

I have found it a wise procedure to have the whole head prepared for operation and to support the head on a Light headrest which permits making of an opening at any point in the head. If the subtemporal openings are unproductive of blood, occipital openings are made in the hope of meeting with a hematoma, or if these openings also are clear of blood they may later be utilized for ventriculography if the problem has not resolved itself completely.

In those instances in which the clinical picture requires solution days or even months after the injury, the head is generally supported in a similar fashion and three openings are placed on each side, one in the frontal, one in the occipital and one in the subtemporal region. Again if the problem does not resolve itself on inspection of the multiple burr openings, ventriculography may be resorted to (figs. 1 and 2).

The supportive treatment of such patients may be most exacting. They are frequently comatose for long periods following operation. Careful attention must be given to fluid and protein balance, to aspiration of the accumulations within the trachea, and frequently administration of one of the sulfonamide drugs is indicated as a prophylactic against the development of pneumonia. Special nursing care is extremely advantageous among the sicker of these patients.

BRAIN TRAUMA

Definitions are essential for clarity of thinking in dealing with this phase of the problem. My associates and I reserve the term cerebral concussion for cases

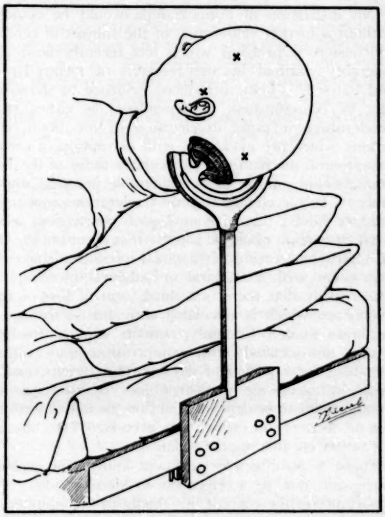

Fig. 2.—Side view of head rest.

in which consciousness is lost, and we regard concussion as a purely physiologic state in which neural activity is temporarily disrupted without there being demonstrable anatomic change. The disruption of neural activity may precipitate abnormal physiologic mechanisms which lead to later organic alterations, and

it would seem likely that prolonged states of unconsciousness may be due to such anatomic alteration, so that we prefer to use the term concussion for transient states of loss of consciousness, lasting minutes rather than hours.

The next accepted subheading in the classification of injuries to the brain is cerebral contusion, which represents a definite pathologic state in which there are petechial hemorrhages, whose mode of production need not concern us here but which I believe may be the result of increased permeability of the vessel wall.[7] This state, which is easily recognized pathologically, may escape detection clinically if the bruised area of the brain lies in a quiet area. In the nonsilent zones of the brain contusion may produce some clinically recognizable disturbance of neurologic function, such as alteration in the reflexes or weakness.

Actually we recognize an intermediate state antedating the development of cerebral contusion, that of cerebral edema, in which an antecedent escape of fluid occurs before the condition becomes serious enough to permit the escape of red blood cells into the extravascular spaces.[8] The clinical recognition of this condition is dependent chiefly on the height of intracranial pressure, but conceivably it may also result in dysfunction of cerebral gray matter.

Cerebral laceration is that condition in which there is actual rupture of continuity of intracerebral tissue. Clinically there is generally severe disturbance of neural activity manifest in such individuals, and it is apt to be associated with prolonged periods of unconsciousness.

No discussion of brain trauma would be complete without a further elaboration of the subject of cerebral concussion, a problem which has recently been considerably clarified by the research of Denny-Brown and Russell.[9] They introduced evidence to show that loss of consciousness is dependent on either rapid acceleration or rapid deceleration of the brain, conditions which are associated with disruption of certain basic neural mechanisms, particularly those of the hind brain. This concept has considerable practical importance. To acceleration and deceleration concussion must be added that of compression concussion, which is the disruption of neural activity that occurs in the face of rapidly increasing intracranial pressure, since this may occur with extradural or subdural bleeding. It seems likely that there is a third form of loss of consciousness, which is associated with diffuse damage of the brain tissue. Certainly, patients with severe head injury unassociated with compression may remain comatose for a period of days or even weeks, and in these instances the persistent loss of consciousness would appear to be dependent not on the initial acceleration or deceleration (which may even have been absent) but rather on diffuse neural damage.

There is no effective treatment known for cerebral concussion due to acceleration or deceleration. The importance of the concept lies chiefly in the adoption of prophylactic measures designed to reduce the frequency of its occurrence. A person who has suffered transient loss of consciousness is, in our practice, placed at bed rest for a period of one to three weeks. There is a tendency recently in the hands of neurologic surgeons to shorten this period in the belief that psychogenic factors which may contribute to post-traumatic headache and dizziness are nursed by oversolicitude. This would indicate that the length of the rest period must be decided with care.

The clinical recognition of the presence of cerebral edema is at best difficult, so that judgment as to the effectiveness of therapeutic methods employed is perilous. The same general principles of bed rest are applied in cases of edema and of contusion. In addition there are theoretical reasons for feeling that oxygen therapy may be of value, possibly resulting in the facilitation of oxygen transport across the barrier between blood vessels and brain tissue, which barrier presumably is heightened by the accumulation of perivascular fluid. Likewise the treatment of cerebral contusion is on a somewhat empirical basis, which consists again of supportive treatment, bed rest and oxygen therapy. Morphine is to be avoided because it is a respiratory depressant. We are not ardent advocates of the use of hypertonic solutions,[10] but rather are inclined to question their effectiveness and to raise the query of whether it is not possible that they may even in certain circumstances do harm to the state of the vessel wall. We attempt to maintain a fluid balance which is about normal for that individual at bed rest and do not subscribe to the theory that dehydration is of value. Neither do we employ frequent lumbar puncture for drainage, though occasionally we resort to puncture to relieve the severe headache which may accompany traumatic subarachnoid hemorrhage.

Sedation may at times become imperative. We employ moderate amounts of bromides and chloral hydrate for restlessness. Acetylsalicylic acid and acetophenetidin may be helpful in controlling headache and occasionally recourse may have to be had to codeine. But morphine, it should be reiterated, is to be avoided.

Proper attention to oral hygiene and to aspiration of the throat is imperative for the comatose person. Semi-Fowler's position, because it facilitates venous return from the head and facilitates swallowing, is probably the best position for those individuals not in shock. Very occasionally it may seem desirable to place the patient in the ventral position with the head low to permit drainage of oral secretions.

The débridement of lacerated cerebral tissue is a matter which should ideally be left to the neurologic surgeon or a surgeon familiar with neuroanatomy and neurophysiology. This because of the fact that a nicety of judgment is essential in the proper handling of such wounds. Likewise the removal of foreign bodies may better be left to such individuals. In those instances in which they can be removed without greater extension of damage, their removal is permissible. However, further interference with function is to be avoided.

SUMMARY

Head injuries may be divided into four general groups: those affecting the scalp, those of the skull, those in which bleeding of epidural or subdural nature has occurred, and finally those which affect cerebral substance per se. These injuries may of course occur individually or in combination.

(This symposium will be concluded in the next issue)

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8. Evans, J. P., and Scheinker, I. M.: Post-Traumatic Cerebral Edema, to be published.
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THE BRITISH ARMY BLOOD TRANSFUSION SERVICE

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The following brief account gives a description of the British Army Blood Transfusion Service from its inception to the present time and shows how big an organization has had to be developed from very small beginnings in order to meet the demands of war in the large number of theaters now existing.

The original technical staff, drawn almost entirely from the laboratories of the Royal College of Surgeons and the Middlesex Hospital, were selected before the war, and agreement was obtained for them to mobilize and start work in a west country region as soon as needed. A basic panel of some 5,000 donors was obtained before war broke out. The birth pains of the service were severe, but not protracted. Appropriately, the unit was first accommodated in a vacated maternity ward of a large hospital, which engineers converted into the necessary laboratories in about forty-eight hours; this had to suffice until the separate buildings were completed early in 1941. From these temporary quarters both the French and the Norwegian campaign were supplied with transfusion fluids and equipment, largely by an air service which carried stored blood to the transfusion units operating with the armies themselves. During the first six months of the "phony" war the unit had ample time to develop its technic of blood collection, to raise a big donor panel, to carry out considerable research work on the keeping properties of blood, especially when transported overseas, on the merits of the various [1] blood substitutes and to develop a technic for the filtration of plasma.[2] This last proved to be of inestimable service for the future. In 1941 the service was presented with its own plasma (or serum) drying plant by the Silver Thimble Fund of the Women of India, which, owing to the severe bombing of the headquarters itself and which even more frequently involved the services of gas, water and electricity, had to be erected at a shadow headquarters some 35 miles away. The drying plant has now an output of twelve to fourteen hundred 400 cc. bottles a week; it is of the latest pattern, utilizing the principles of Greaves and Adair [3] and the spin-freezing technic.[4]

Supplies of dried plasma have been considerably augmented by material dried in the much bigger Medical Research Council drying plant.

In 1942 the requirements had so increased that the service had to be allotted another region from which to obtain donors, while the arrival of United States forces necessitated the provision of additional staff and equipment for the preparation of the large amounts of crystalloid fluids required by them. The Transfusion Service now operates in some nine hundred different donor centers. It has a staff of about four hundred, of which 80 per cent are women (V. A. D.'s and A. T. S.'s) [4a] and it supplies transfusion fluids (protein and crystalloid) and equipment to the whole British army overseas, in every theater of war and in every outlying station from Iceland to the Cape and from England to the Far East. In addition, the basic requirements of the forces at home are cared for and most of the civil needs in the two regions in which the service operates. The civil transfusion services have always generously supplemented the army resources whenever the need has arisen.

The main functions of the Army Transfusion Service are the provision of supplies as stated, the mobilizing, equipping and training of special transfusion units for service overseas and the training of all ranks of the Royal Army Medical Corps in resuscitation work. In this respect, the British army differs from all other armies, allied or enemy, in that it has provided a distinct transfusion service with its own noncommercial source of supply of all transfusion fluids and equipment and with specially trained distinct mobile resuscitation teams which are self contained and which can be attached to any appropriate medical unit overseas.

REGISTRATION OF DONORS

The Donor Registration and Publicity Department has a panel of approximately 350,000. Major publicity campaigns are conducted six times a year, while minor campaigns in factories, villages and small towns are in continuous operation in a definite cycle in relation to the visits of the blood collecting teams. A donor panel is always a wasting asset and cannot be maintained or increased without continuous publicity. It has been clear too that the public responds well when the war news is active, irrespective of whether it is good or bad, but it is apt to slack off during stagnant periods unless constantly appealed to. The best results, with the highest turn up at the center, are obtained by small local publicity campaigns just prior to the visit of the blood collecting teams. Nationwide appeals are ineffective unless the personnel are available to strike while the iron is hot. The public resents being appealed to urgently for volunteers when afterward those same volunteers are not called on for several months.

COLLECTION OF BLOOD

Bleeding is carried out by fifteen mobile self-contained fully equipped teams, each consisting of a medical officer, four V. A. D.'s, two A. T. S. drivers and an A. T. S. orderly. The medical officer is frequently a woman officer of the Royal Army Medical Corps who has all the privileges of a male officer and is likewise subject to military discipline. The principle is that the teams go to the donors, who are called to a nearby convenient center. Each team carries in its two vehicles (a lorry, equipped with a refrigerator, and a four seater car) the full equipment for converting any reasonable sized room into a miniature hospital ward in about twenty minutes, as well as facilities for supplying comforts and refreshment to donors. The whole area covered by the service is regionalized so that teams are detached and quartered in a large town, whence they bleed the surrounding area for a distance of 25 to 30 miles. The takings are ferried in refrigerator trucks back to headquarters, whence the team is serviced with fresh apparatus, clean linen and comforts. For steady work a team is expected to obtain from 70 to 90 pints of blood daily. In times of emergency, over short periods of time, a single team has obtained as many as 320. From each donor 440 cc. of blood is collected into 100 cc. 3 per cent sodium citrate, to which is added 20 cc. of 10 per cent dextrose with the special apparatus to be described.

1. Buttle, G. A. H.; Kekwick, A., and Schweitzer, A.: Lancet **2**: 508, 1940.
2. Bushby, S. R. M., and Whitby, L. E. H.: J. Roy. Army M. Corps **76**: 4, 1941.
3. Greaves, R. I. N., and Adair, M. E.: J. Hyg. **36**: 507, 1936.
4. Lanyon, E. C. G.: J. Hyg. **41**: 111, 1941. Greaves, R. I. N.: J. Hyg. **41**: 489, 1942.

4a. V. A. D. = Voluntary Aid Detachment. These are women who are not trained nurses, but who do nursing duties under supervision. A. T. S. = Auxiliary Territorial Service (women). These are the khaki dressed "soldiers" of Britain's female army.

TRANSPORT OF BLOOD

In the French and Norwegian campaigns a whole blood service was maintained to the overseas forces. Distance now prohibits such supplies from the home country, but an ample blood service is provided by base

Fig. 1.—Insulated box for air transport of blood, with insert in lid. Capacity 20 pints of blood in crates with administration sets. Weight 110 pounds. Maintains temperature at 4 to 6 C. for eight hours. (Photograph by courtesy of Norman K. Harrison.)

transfusion units, which are to be found in every theater of war. These units are the local opposite number of the big central organization at home; they are equipped with refrigerator trucks; blood is obtained from base stationed troops. Only group O blood is supplied. This is double checked for group and submitted to Kahn's test before dispatch. Early experiments with transport of blood to France had shown that, if the bottle was filled right to the top to prevent slopping, the blood traveled well. "Topping" is carried out with a special machine with which a fine needle is made to pierce the bung of the bottle; with a two way connection, air is sucked out of the bottle and dextrose solution admitted until the bottle is full; the track of the needle is self sealing on withdrawal. The main transport is by air in insulated boxes containing ice inserts which maintain a temperature of 2 to 6 C. for eight hours (fig. 1). The weight of one box containing 20 pints of blood is 110 pounds.

PROCESSING OF BLOOD

The majority of the blood taken by the home depot is processed to form plasma, which is either dried for export to any theater of war, more especially theaters in tropical countries, or supplied in fluid form for use in temperate climates and especially for such expeditions as commando raids. Early experiments [1] had indicated that plasma had certain advantages over serum, while considerable clinical experience during bombing raids produced ample evidence of the efficiency and safety of plasma.[5] The main problem with plasma has been the making of a guaranteed sterile product which could be judged fit for use according to its macroscopic appearance. The common precaution of siphoning off in a closed system and storing the plasma in the frozen solid state until just before use is not applicable to active service conditions. Clarification and filtration is the obvious method for obtaining a clear sterile product, but the filtrate invariably clots, especially if the convenient Seitz asbestos pad filtration method is used. Clotting occurs because prothrombin is activated to form thrombin by the magnesium of the asbestos pad. The difficulty can be eliminated by frequent washing of the pad with weak alkali to remove the retained prothrombin,[2] or by filtering at such a p_H that prothrombin cannot be activated.[6] This last method is the one now used. The resulting plasma is gin clear and stable; it has been exported as far as India, where it has been used with success in the Burma campaign. This fluid plasma needs to be kept cool but need not be refrigerated. Postfiltration clotting is encouraged by shaking; bottles are therefore filled right to the top.

Dried plasma is also made from filtered plasma; it is disposed in units of 400 cc., which are spun frozen in a standard transfusion bottle (fig. 2) and the water

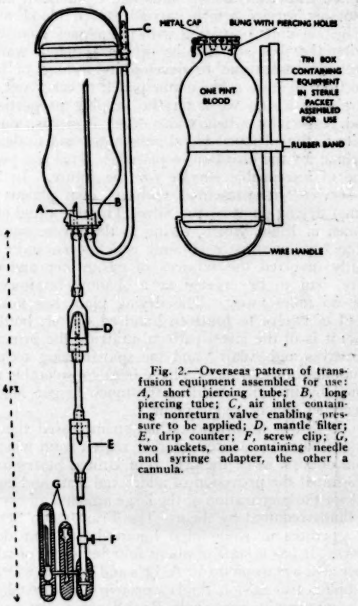

Fig. 2.—Overseas pattern of transfusion equipment assembled for use: *A*, short piercing tube; *B*, long piercing tube; *C*, air inlet containing nonreturn valve enabling pressure to be applied; *D*, mantle filter; *E*, drip counter; *F*, screw clip; *G*, two packets, one containing needle and syringe adapter, the other a cannula.

sublimated from the frozen state.[3] Each bottle exported is accompanied by 400 cc. of pyrogen free distilled water, also contained in a transfusion bottle, together with the apparatus for administration.

5. Kekwick, A.; Maycock, W. d'A., Marriott, H. L., and Whitby, L. E. H.: Lancet **1**: 99, 1941.
6. Bushby, S. R. M., and Whitby, L. E. H.: J. Roy. Army M. Corps **78**: 255, 1942.

TRANSFUSION EQUIPMENT

All transfusion fluids, wherever exported, are accompanied by administration apparatus assembled at the home depot; this is packed in tins sterilized for immediate use (fig. 2). In principle, the apparatus is the same whether it is to be used for blood, fluid plasma, dried plasma or a crystalloid solution; the only modifications are in the bungs, placed in the different bottles, but these permit any administration set to be used. All bottles are standard throughout all the services, naval, military, Royal Air Force and civil. Of other equipment, the service has devised and issued special boxes to meet the transfusion needs of military hospitals, field ambulances and troopships as well as complete apparatus for full resuscitation work by mobile field transfusion units and by the air borne medical units; these last are dropped by parachute (fig. 3).

Fig. 3.—Wicker parachute basket for dropping supplies of transfusion fluids. (Photograph by courtesy of Norman K. Harrison.)

GROUPING SERUM

Owing to storage difficulties, the army is issued dried grouping serum (human) which needs no refrigeration. Drying is carried out in the plasma drying plant. The serum is disposed in tubes, the equivalent of 1 cc. of the fluid, containing indicator silica-gel, which ensures complete dehydration as well as indicating fitness for use. Group A serum is colored amber with acriflavine; group B serum is colored blue with methylene blue. The minimum titer is 1 in 32 against A_2 cells and 1 in 64 against B cells.

PACKING AND DISPATCH

Transfusion fluids are packed in boxes suitable for manhandling overseas, which contain the appropriate number of administration sets and, where necessary, water for reconstitution. The weight of a box is approximately 56 pounds (fig. 4).

TRAINING AND MOBILIZATION

Regular courses of instruction in resuscitation and transfusion work for officers and other ranks have been held since 1940; many United States officers have attended this school, as well as officers from the Royal Navy, Royal Air Force, Civilian Emergency Medical Service and several of the allied forces. The home headquarters is the center for the mobilization, equipping and training of all transfusion units proceeding overseas, including such specialties as refrigerator maintenance and repair, autoclave duties, crystalloid preparation and assembly, reconditioning and repair of transfusion apparatus.

OVERSEAS ORGANIZATION

In every theater of war there is a base transfusion unit, which is the link with the home depot. The main functions of these units are to estimate, obtain from home and distribute supplies and transfusion equipment to the force. They are also equipped for the production of crystalloid solutions, for the assembly of apparatus, for the servicing and repair of refrigerators and for the exploitation of local resources, usually base troops, for the obtaining of supplies of whole blood. This is sent forward by air in insulated boxes (fig. 1) by road by refrigerator truck or sometimes along a coast in the refrigerator of a hospital ship. When the base transfusion unit is within reasonable air distance of the home unit, as in the French campaign, the latter is responsible for the supply of blood. It may be mentioned in passing that all with experience, including the Germans, have found it impracticable to obtain supplies of blood on the spot from medical personnel or the walking wounded; in busy times no more than two or three transfusions a day can be so performed.

In every corps there are a number of mobile field transfusion units, which are self contained, have their own transport, including a refrigerator mounted on a lorry, and are fully equipped for the performance of resuscitation in the field. They are serviced by the base transfusion unit and, being equipped with a refrigerator, are the units which receive the supplies of blood sent from the base. During active operations the field transfusion units are attached wherever their services are most needed; they have operated mainly in collaboration with field surgical units to form complete surgical centers at field ambulances, field dressing stations and casualty clearing stations.

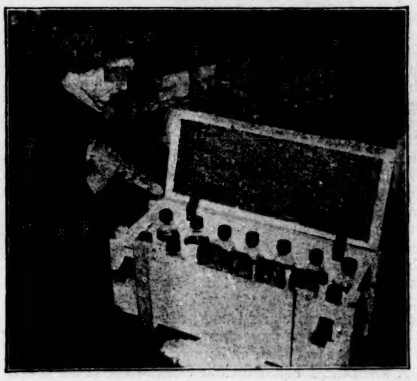

Fig. 4.—Standard packing for all exported transfusion fluids, with administration sets. Weight 56 pounds. (Photograph by courtesy of Norman K. Harrison.)

The virtues of this separate transfusion service, which is peculiar to the British army, are that the personnel are especially trained and highly skilled, their supplies

are the special concern of particular units instead of being part and parcel of general medical supplies, and this is important when perishable (and potentially dangerous) fluids such as blood are concerned. For example, the base unit is responsible for obtaining blood and arranging for prompt air transport, and the field unit is responsible for meeting the plane at the forward landing ground and transferring the blood to its refrigerator without delay. This does not mean to say that the ordinary general duty medical officer does no transfusion work. All medical units are equipped to do transfusion work, but their other multiple duties prohibit large scale work, and in selected centers there is a definite need for a specially trained full time officer and staff. The personal element in the service has been one of its greatest successes and has created a fine *esprit de corps;* the reputation and activity of the field transfusion units have become a byword among surgeons in all theaters of war.

BLOOD DONORS

The number of blood donations to the army service to December 1943 was approximately 400,000; these have mostly been given by the general public, some persons having donated seven or eight times; home based troops, Royal Air Force ground staff and Royal Naval Dockyard staff have also contributed. There have as yet been no fatalities among donors. The accident and complaint rate has been 1 per 3,678 bleedings, of which the following is an analysis: hematoma 27, cellulitis 8, thrombosis 4, accidents due to fainting 16, dermatitis 10, unclassified hysteria and so on 22, total 87. Claims for compensation have amounted to 13, giving a rate of 1 in 24,615. Twelve of these claims have been trivial, for such things as spectacles broken while fainting, totaling £72. 2. 0. The grand total has been largely made up of one claim for £60, being loss of wages owing to absence from work, following on cellulitis of the arm. All manufacturing firms have cooperated most loyally in allowing employees time off for blood donation without claiming wage compensation. An analysis of 10,000 carefully observed cases [7] has shown that the faint rate among donors who are superficially selected on history, general appearance and blood pressure reading is about 2.8 per cent. The most dangerous type of faint is that which occurs from half an hour to six hours after bleeding, when the donor is back at work or out in the street. There can be little doubt that after four years of war the average hemoglobin level of the population is lower than before the war; the number of potential donors rejected is now much greater than in 1939-1941.

	Whole Blood × 560 Cc.	Dried Plasma × 400 Cc.	Fluid Plasma × 500 Cc.	Crystalloids × 500 Cc.	Administration Sets
B. E. F. and Norway	2,580	.....	695	3,000	2,580
Middle East	.....	39,470	5,350	1,000	54,462
North Africa	.....	20,009	9,000	28,500	25,536
India	.....	16,225	3,500	.....	10,184
Persia	.....	4,300	3,000	.....	4,500
Outlying stations	.....	9,000	2,000	4,500	10,437
U. S. forces	.....	.....	.....	134,267	.....
Home forces	800	22,000	25,534	6,000	68,439
Civilian and other services	5,410	2,600	5,500	.....	7,944
	8,790	104,604	54,449	177,267	184,172

STATISTICS

The accompanying table gives some idea of the exports of the service since the beginning of the war; it is by no means complete and contains only main items.

UTILIZATION OVERSEAS

The records of the amount of transfusion work carried out overseas are necessarily incomplete, but sufficient statistical evidence is now available to show on what scale transfusion supplies should be provided. The following facts give this information:

Dunkirk Campaign.—The records obtained from surviving members of The Army Transfusion Service showed that some 400 pints of blood [8] were used during the short Dunkirk campaign; this blood had been supplied by air from the home depot.

Middle East.—An analysis of 11,732 admissions for wounding (not total casualties) in the battles from El Alamein to Enfidaville has shown that 1,119, approximately 10 per cent, required transfusion with 2.9 pints of protein fluid (blood or plasma) per case. This is the overall figure. But when wounded are selected by reason of severity, as at an advanced surgical center, the proportion requiring transfusion is almost double, and likewise the amount of protein fluid per case; here too a higher proportion of blood is required.

In North Africa almost similar figures have been obtained. There, of 16,674 admissions for wounding, 10 per cent required transfusing with 3 pints of protein fluid, and here again, at selected centers, where severe casualties are admitted, the rate rises to as high as 25 per cent.

All surgeons with active service experience have found it necessary to have a proportion of blood available with which to supplement their ample supplies of plasma. This is required especially for abdominal cases, for those who have to receive a massive transfusion exceeding 4 to 5 pints of protein fluid, for those who have been resuscitated in a forward area and have subsequently deteriorated again during evacuation, for septic patients and, with advantage, for any transfusion required during operation or as a postoperative measure. In general terms, if protein fluid is supplied on an overall basis of 3 pints per 10 per cent of casualties in the proportion of 1 pint of blood to 2 of plasma, the supplies are sufficient, provided they are distributed so that selected centers receive double quotas. Between July 1940 and June 1943 the base transfusion unit of the Middle East forces provided 10,379 pints of blood obtained from base troops, while in North Africa during six months' campaign 1,094 pints was so provided.

As to crystalloid fluids the utilization appears to be on the same scale as protein fluid, namely 3 pints per 10 per cent of wounded admissions. The large consumption is accounted for almost entirely by the requirements in abdominal cases during the postoperative period when they are treated by gastric suction and hydrated by the intravenous route. Each patient may require 15 to 30 pints in the four or five days following operation.

GENERAL POLICY

The foregoing account will make it clear that the policy of the British army has been to supply transfusion fluids to the places where they are needed, complete with administration apparatus, and to train officers and men specially for this important side of war casualty work. There can be little doubt that this policy permits of very much more efficient transfusion work than that pursued by the enemy countries, who have relied on mass blood grouping of troops, from whom blood is obtained on the spot, and on synthetic blood substitutes not far in advance of the acacia saline solution of the last war and greatly inferior to natural blood plasma.

7. Poles, F. C., and Boycott, M.: Lancet **2**: 531, 1942.

8. Maycock, W. d'A.: Brit. M. J. **2**:467, 1940.

Clinical Notes, Suggestions and New Instruments

SUPRAPUBIC SUCTION

THREE NEW APPLIANCES

CLARENCE G. BANDLER, M.D.; IRVING HELFERT, M.D., AND BERNARD D. PINCK, M.D., NEW YORK

Surgical extirpation of the prostate may be performed through three approaches: the transurethral, the perineal and the suprapubic. The oldest of these, and still a very popular procedure among urologists, is the suprapubic operation.

This procedure is carried out in either one or two stages, the first stage consisting of cystostomy for drainage, and the second stage the actual enucleation of the prostate gland. Despite the individual technical variations of the many proponents of this approach, suprapubic drainage of some type is utilized postoperatively.

When the two stage operation is selected, ordinarily a Pezzar catheter is employed for the cystostomy. After prostatectomy has been performed, either as the second stage of the two step operation or as a single procedure, hemostasis and drainage are effected by the following means:

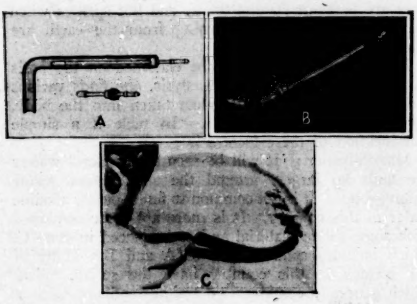

Fig. 1.—Suction piece designed primarily for Pezzar tubes: *A*, diagrammatic representation; *B*, component parts; *C*, applied after cystotomy.

1. Use of Pilcher or Hagner bag.
2. Packing of prostatic bed and utilization of Freyer tube for drainage.
3. Packing of bed and use of Pezzar catheter for drainage.
4. Packing of bed without additional tube drainage.
5. Tube drainage suprapubically without hemostatic device in prostatic bed.
6. Foley hemostatic bag by urethra with or without suprapubic drainage.

It is now generally recognized that some type of suction appliance facilitates the postoperative course, because wound healing is accelerated and the patient is spared the anguish of constant abdominal urinary leakage. Many urologic clinics are now utilizing several varieties of suction mechanisms. These are individual units based on either water suction, siphonage or electric motor. Regardless of the apparatus employed it is necessary in every instance to have an adequate sterile connection between the suction and the operative zone. A variety of appliances have been constructed for this purpose, but thus far objectionable features have not all been overcome. Heretofore no true mechanical device has been designed for tube drainage, most clinics employing some makeshift arrangement which does not allow adequate suction or afford sterility. Skin suction instruments of several varieties have not met requirements for ease in sterilization and maintenance of a dry wound.

From the Department of Urology, New York Post-Graduate Medical School and Hospital.

In this communication we present three new devices which will meet every drainage contingency of suprapubic procedures. The instruments may be constructed of chromium plated brass, stainless steel or transparent plastics.

Figure 1 demonstrates an easily applicable suction piece designed primarily for Pezzar tubes. The apparatus consists of three separable parts. This construction permits ease in cleaning by nurse or orderly.

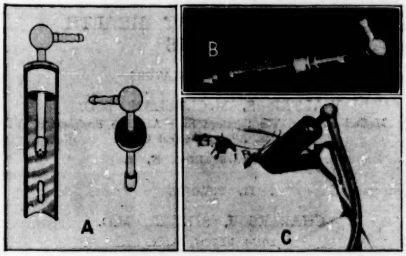

Fig. 2.—Device designed for suction through a Freyer tube; *A*, diagrammatic representation; *B*, component parts; *C*, applied after prostatectomy.

Figure 2 demonstrates the second device, which has been designed for suction through a Freyer tube. This attachment is applied six hours after operation. It can be inserted with ease and provides a sterile protective cap for the open Freyer tube.

Figure 3 is the appliance employed for direct contact with the incisional area. This apparatus is used when all tube drainage has been disconnected and as long as abdominal leakage persists.

At the New York Post-Graduate Medical School and Hospital all three instruments are employed routinely for suprapubic prostatectomies. It is our feeling that certain objectionable features of previous suction connectors have been overcome. It is to be noted that the devices are applicable in a variety of other instances when tube or fistula drainage is present. Thus the implement shown in figure 3 has been successfully employed in draining duodenal and biliary fistulas.

Fig. 3.—Appliance employed for direct contact with the incisional area: *A*, diagrammatic representation; *B*, component parts (1) assembled plastic sets, (2) metal instrument; *C*, applied directly to wound.

COMMENT

Although the three new suction attachments are designed primarily for suprapubic surgery, they may be employed in answer to other operative necessities. Separable parts allow for ease in cleaning and sterilization. It is our feeling that the advantages of suction can best be achieved wherever surgical procedure warrants the employment of these devices.

Special Article

AMERICAN HEALTH RESORTS

NATURE OF NATURAL THERAPEUTIC AGENTS USED AT HEALTH RESORTS

I. MINERAL WATERS

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Medical Director, The Saratoga Spa; Associate Professor of Medicine, Albany Medical College
SARATOGA SPRINGS, N. Y.

II. PELOIDS

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LONG BEACH, N. Y.

These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

A consideration of the natural resources of a health resort includes a description of the mineral waters or peloids which are found in that location. Climate, of course, is a natural resource as well. It is our purpose in this paper to discuss information regarding the nature and types of mineral waters and peloids found at health resorts. It should be stressed that the type of treatments which may be developed at a health resort will depend to a considerable degree on the nature of the mineral water or peloid available. The entire program, however, has certain common features in all places. The general aspects of treatment in health resorts will be emphasized in other papers.

The definition of a mineral water differs with the point of view of the discusser. The geologist will class all waters which come from deep in the earth's crust as mineral waters. The chemist will look to the amount, nature and type of minerals in the waters. The physician is particularly interested in the therapeutic response to the use of these waters. A simple definition from the medical standpoint would be "Mineral waters are natural waters which have therapeutic value because of their nature and constituents."

Peloid is an internationally accepted term for all types of muds, moors and peats used for therapeutic purposes. Peloids have worldwide therapeutic use for topical application in various chronic diseases, and there is a steadily increasing interest in their usage in this country. It is necessary, therefore, to include information on the different types of moors and muds which are available in various health resorts.

It is impossible to present within the scope of this paper full details regarding all types of mineral water and peloids which are found in the United States. The following discussion will therefore present in broad outline the basis on which any physician may interpret the reported analyses of mineral waters and peloids and evaluate for himself in general the indications for their use.

From the Medical Department of the Saratoga Spa.

I. MINERAL WATERS

A. METHODS OF PRESENTING INFORMATION REGARDING MINERAL WATERS

1. *Simplified Classification Used for Teaching.*[1]—There is no universally accepted outline by which the type and nature of mineral waters may be described. I have for some years in lecturing in medical schools used a simplified classification, recognizing that it is not complete. It has, however, been found to cover nearly all the possibilities and offers a general scheme for the evaluation of the mineral water of any resort.

A series of tables will give the outline as presented.

Temperature: Mineral waters may be divided on the basis of the temperature at which they come to the surface of the earth. The dividing line between nonthermal and thermal springs may be taken roughly as 15 degrees above the mean average air temperature of their location. This, of course, would vary in different parts of the United States, but for practical purposes the temperature of 70 F. is generally accepted as the dividing point. In the thermal group those above 70 F. are divided into warm or tepid springs when they are between 70 and 98 F. and hot springs when their temperatures on emerging from the earth are above 98 F.

Mineral waters may also be classified on the basis of mineral content. In the analysis, one finds various anions and cations which, when taken into the body, will produce definite effects. In table 2 a simple classification of these factors is given.

Mineralization: It will be seen that mineral waters are built up largely around the alkaline and saline anion groups. It is not common to find a purely alkaline water in this country. It is more apt to be combined with some saline material and to be placed in class C, which includes combinations of A and B. Many of the springs in this country have the sulfate anion, which generally combines with either sodium, calcium or magnesium. Also there are many waters with chlorine as the principal anion, and in some places both sulfate and chlorine are found in the same water.

For centuries, waters containing iron have been considered in a special group. In the earlier literature the term "chalybeate" is applied to these waters. In order to be classed as an iron water it should contain at least 10 mg. of ferrous or ferric iron per liter. Many waters are found which contain less than this and, while they may be therapeutically active, it is necessary to determine some point at which a water may be included in this group.

The neutral or indifferent waters are those that contain only traces or relatively small amounts of mineral constituents. In general, many of our thermal waters in this country are lightly mineralized. This does not mean that they are not of value from a therapeutic standpoint, but one cannot base the therapeutic effect on their mineral content.

Gaseous Constituents: Many mineral waters likewise contain dissolved gases, and in table 3 are listed the gases which may be found in the various waters. Of this group, from a therapeutic standpoint, carbon dioxide, hydrogen sulfide and radon must be considered

1. McClellan, W. S.: Hydrotherapy and Balneotherapy: Outline in Lectures on Physiotherapy, Department of Therapeutics, New York University Medical School; Hydrotherapy and Balneotherapy: Modern Medical Therapy in General Practice, Baltimore, Williams & Wilkins Company, 1940, vol. 1, p. 415.

of importance. The other gases are either inert or are not present in sufficient quantities to produce a therapeutic effect.

Waters also differ in their physical properties, and in table 4 is given a brief outline of such characteristics which should be included in giving a well rounded picture of any mineral water.

Physical Properties: The importance of these physical properties as they influence the palatability and the therapeutic influence of the water is evident from the outline.

In making an analysis of mineral water, the constituents are determined as ions. It would be advisable to present the analysis of any mineral water on this basis. This practice is not followed in the United States, although it is commonly used in Europe. The more accepted practice is to present the hypothetical combinations of these ions as calculated from their individual determinations. In table 5 are presented both the ionic analysis and the hypothetical combinations of the Hathorn No. 2 Spring at Saratoga Spa, which may be taken as a sample form in which any analysis may be reported.

TABLE 1.—*Temperature*

A. Nonthermal	Below 70 F. (21 C.)
B. Thermal	Above 70 F. (21 C.)
1. Tepid	70-98 F. (21-37 C.)
2. Hot	Over 98 F. (37 C.)

TABLE 2.—*Mineralization*

	Anions (Neg.)	Cations (Pos.)
A. Alkaline	HCO_3 } CO_3 }	{Na, K, Ca {Mg, Ba, Fe
B. Saline	SO_4	Na, Ca, Mg
	Cl	Na, K, Ca, Mg, NH_4, Li
C. Combinations of A and B		
D. Iron water		
E. Neutral or indifferent		

Analysis of Hathorn No. 2: The physician has in the past felt a sense of confusion when presented with the detailed ion analysis and has tended to rely on the hypothetical combinations for his interpretation of the influence of a mineral water. This approach is changing, as the younger physicians are now well trained in their courses of biologic chemistry to interpret and analyze the effects of ions in the human body. We do not think today so much of the effect of sodium chloride as a salt in the body as we do of the influence of its individual constituents sodium and chlorine. With an increasing fund of knowledge regarding the effects of these individual mineral ions in the body, the use of the ion analyses for presenting data regarding mineral waters will become more common.

It is also possible to present this information in graphic charts. They, however, do not lend themselves well to showing the amount of minerals which are present in small quantities. The graph will emphasize more particularly the major constituents, while those which are present only in traces or minimal amounts cannot be clearly shown to scale.

I have found the foregoing outline to be of real value in presenting information regarding the mineral waters to medical students and other medical groups.

2. *Mineral Waters as Discussed by W. S. Collins.*[2]—In reporting information regarding mineral waters, Dr. Collins has followed a somewhat different form. He has discussed the relation of ground and surface waters and included the concentrated chloride and sulfate brines found in the various parts of the country. Among waters with minor constituents he considers sulfur waters as those containing hydrogen sulfide, alum waters based on their aluminum content, chalybeate waters, the bromide and iodide waters, arsenic waters, lithia waters and radioactive waters. This outline, however, does not give any framework by which a general picture can be developed.

TABLE 3.—*Gaseous Constituents*

A. Oxygen
B. Carbon dioxide
D. Hydrogen sulfide
D. Nitrogen
E. Radon (radium emanations)
F. Combinations of two or more gases
G. Nongaseous

TABLE 4.—*Physical Properties*

A. Color
B. Odor
C. Taste
D. Texture
E. Gravity (tonicity)
F. Supersaturation (CO_2)
G. Temperature

3. *The Register of Spas and Mineral Waters Prepared by the Standard Measurements Convention of the International Society of Medical Hydrology.*[3]—About fifteen years ago an effort was made to unify the methods of reporting information regarding spas and mineral waters. This was made under the direction of the Committee of the International Society of Medical

TABLE 5.—*Analysis of Hathorn No. 2*

(Results in parts per million or milligrams per liter)

Ions and Radicals			Hypothetical Combinations	
SiO_2	(Silica)	12.4	Ammonium chloride	49.0
SO_4	(Sulfuric acid radical)	None	Lithium chloride	44.0
HCO_3	(Bicarbonic acid radical)	4682.6	Potassium chloride	882.5
NO_3	(Nitric acid radical)	Trace	Sodium chloride	7615.4
NO_2	(Nitrous acid radical)	Trace	Potassium bromide	45.9
PO_4	(Phosphoric acid radical)	None	Potassium iodide	3.5
BO_2	(Metaboric acid radical)	Trace	Sodium sulfate	None
Cl	(Chlorine)	5088.8	Sodium metaborate	Trace
Br	(Bromine)	30.8	Sodium nitrate	Trace
I	(Iodine)	2.7	Sodium nitrite	Trace
Fe	(Iron)	5.9	Sodium bicarbonate	651.1
Al	(Aluminum)	1.8	Calcium bicarbonate	3250.6
Mn	(Manganese)	Trace	Barium bicarbonate	52.8
Ca	(Calcium)	799.0	Strontium bicarbonate	Trace
Ba	(Barium)	38.0	Ferrous bicarbonate	18.7
Sr	(Strontium)	Trace	Magnesium bicarbonate	1991.6
Mg	(Magnesium)	331.0	Alumina	3.4
K	(Potassium)	468.2	Silica	12.4
Na	(Sodium)	3174.4		
Li	(Lithium)	7.2		
NH_4	(Ammonium)	16.5		
O	to form Al_2O_3	1.6		
	Total	14,580.9		14,580.9

Titratable alkalinity = 3,640 p. p. m. $CaCO_3$
Titratable chlorinity = 5,090 p. p. m. Cl

Temperature 10.2 C. at spring

Free carbon dioxide in solution at spring temperature and mean atmospheric pressure (cc. per liter) 1,330 cc.

2. Collins, W. S.: Mineral Waters: Their Composition, Cyclopedia of Medicine, ed. 1, Philadelphia, F. A. Davis Company, vol 8, p. 965.

3. Register of Spas and Mineral Waters Found in . . . Land, prepared in Accordance with the International Standard Measurements Convention of International Society of Medical Hydrology, 1929, specimen copy.

Hydrology, whose membership includes workers in practically all countries where mineral waters are utilized in the treatment of disease. After considerable study, the committee made definite recommendations for the establishment of a Register of Spas and Mineral Waters in any country. They recommended that the material be presented in the language of the country but that the classification of details regarding the nature of the waters and the facilities of the spa should follow a common outline.

The report of this committee was presented in a pamphlet of twenty pages published by the International Society of Medical Hydrology. The outlines presented are without question complete but in some factors extend beyond what would appear necessary for the practical interpretation of any mineral water. The classification of the waters as recommended by this committee is given under the three headings (*a*) chemical characteristics, (*b*) physical characteristics and (*c*) medicinal characteristics.

(*a*) Chemical: In describing the chemical characteristics of the water it recommends the standard analysis by ions, which it suggests should always be presented as milligrams per liter or milligrams per kilogram of the water. Technically it is correct to express them only as milligrams per kilogram, but in mineral waters the liter is the more common measure in use when the physician prescribes the waters. The values in each case differ only slightly, not enough to produce significant errors of interpretation. The committee recommends in addition to the presentation of the chemical data outlined the determination of the concentration ratio, which is obtained by comparing the different constituents with the dominant ion present. In the recommendation of the committee, the dominant ion or the one present in the largest quantity is given a value of 100. Then the concentration factor of this constituent is determined by dividing the milligrams per liter by 100. The concentration of each ion divided by the concentration factor gives its concentration ratio. To the best of my knowledge this interpretation has not been included in any of the work dealing with the springs of the United States, and I am not familiar with its general use abroad.

TABLE 6.—*Chemical Grouping of Waters*

1. Chloride.—Sodium chloride
2. Sulfur.—An alkaline or hydrogen sulfide
3. Sulfate.—As magnesium or sodium salt
4. Acid.—Sulfuric or hydrochloric
5. Iron.—As bicarbonate with excess of carbon dioxide, but sometimes as sulfate with acid
6. Alkaline.—Sodium bicarbonate
7. Calcium.—As carbonate with excess of carbon dioxide or as sulfate or chloride
8. Waters may also be characterized by other elements such as arsenic, lithium, magnesium, bromine and iodine
9. Waters of low concentration

In addition, the committee recommended, as was discussed in a previous section, that the analyst calculate the probable saline combinations for the different constituents found in the mineral water. It also gives directions for the probable chemical combinations, so that all reporting for the register would follow the same method in determining the hypothetical combinations of the salines present in the waters. This procedure in general is followed in the reports available in this country.

The committee also allows for the reporting of the analyses in any standard measurement recognized by the country. For instance, it is common in some countries to report the analyses as parts per hundred thousand. In general, in this country the expressions "parts per million" or "milligrams per liter" are in common use, although in many older analyses the expression "grains per gallon" is found. The latter values may be changed to the standard by multiplying with the factor 17.1.

After the determination of the chemical characteristics, the committee recommends the classification on the basis of the presence of a dominant ion, as shown in table 6.

TABLE 7.—*Physical Classification*

1. Temperature (at the source) a. Cold, below 20 C. (68 F.) b. Subthermal, 20 to 37 C. (68 to 98 F.) c. Thermal, 37 to 42 C. (98 to 105 F.) d. Hyperthermal, above 42 C. (105 F.)
2. Radioactivity a. Of the water itself or b. Of the contained gas
3. Tonicity.—The tonicity may be expressed by the terms hypotonic, isotonic, hypertonic as determined by the influence of the water on the osmotic fluids within and without body tissues
4. Other characteristics include degree of ionization, colloidal properties and gaseous constituents

(*b*) Physical: The committee includes here data similar to those used by me in my teaching outlines. It presents the thermal variations in centigrade temperatures which follow closely the divisions commonly used in this country. It recommends including the data given in table 7.

More recent studies of waters have also revealed information regarding the catalytic activity, peroxidase reaction, electrical conductivity as determined by the various methods available at present, which have expanded the importance of a careful consideration of the physical characteristics of a mineral water. It is advised that these data also be included when they are available.

(*c*) Medicinal: The medicinal classification as presented by this committee is given in table 8. It is evident to the physician that this outline of the medical action of the water is somewhat arbitrary and would no doubt call for more complete description of the influence of the various ions on physiologic processes. These physiologic changes are implied in the table.

In addition to the extensive outline recommended by the committee for the classification of the mineral waters of a place, it also suggests that data be added regarding the climatic characteristics, the geology of the district, the nature of the source of the mineral water, the depth from which it comes, if known, the flow for twenty-four hours and the general character of the surrounding terrain. This information is helpful to the physician, because the climate and other characteristics of a location may be the final deciding factor regarding the selection of the location for his patient. It is true that the cardiac patient does not tolerate hilly country, while he may be able to walk comfortable distances on a level terrain.

As stated, this recommended outline of the International Society of Medical Hydrology is complex in character but has many admirable features. Owing to the development of World War II, the activities of the international society have been suspended for the duration because its membership contained physicians and others interested in mineral waters from practically all countries involved in the present conflict. Therefore the register of spas has not been further developed.

4. *Lehrbuch der Bäder- und Klimaheilkunde, Edited by H. Vogt.*[4]—This two volume edition contains the most complete description of mineral waters, peloids and climate and their application in the treatment of patients with conditions which are influenced by these agents that has come to my attention. Leading experts in their various fields have contributed to this work. They discuss the geology and origins of the mineral waters, the methods of spring control and the administration of these agents in treatment. Also there are complete sections dealing with the chemistry of mineral waters and peloids, as well as pharmacologic and physiologic considerations of their application. The clinical discussions cover the indications and contraindications for balneotherapeutic procedures in various medical conditions. Space does not permit a more detailed review of this excellent work, but the reader is referred to it for a most complete review of the subject.

5. *Newer Information Regarding Minerals Found in Small Quantities.*—With the advent of the spectroscope and the development of new organic compounds for the concentration of various minerals, new tools have become available which are revealing a remarkable picture of elements in the mineral waters which up to the past ten to fifteen years were considered of no importance in the body. The function of these elements is being recognized at the present time, and the newer methods for detecting their presence and quantity are adding valuable information in the field of mineral waters. The work of Strock[5] with the spectroscope on the mineral waters of Saratoga and the development of organic reagents by Baudisch[6] which allows for the concentration of minerals present in small quantities have given valuable information regarding the nature and content of the Saratoga waters. In another paper in this series, Baudisch[7] has reviewed in detail the importance and practical value of these elements present in small amounts (trace elements).

B. CLINICAL APPLICATION OF MINERAL WATERS

It is of interest to consider the way in which mineral waters play their part in the therapeutic program of patients with various conditions. There are five general ways of administering mineral waters. In the first place they may be taken in the form of baths in which temperature, time and nature of constituents play a part. Secondly the mineral waters may be used for the

TABLE 8.—*Medicinal Classification*

1. Purgative or aperient
2. Diuretic and solvent
3. Alterative or tonic
4. Surface action
a. Sedative
b. Stimulant

preparation of hot packs when the factor of heat is of primary importance. Thirdly they may be utilized for gargles and also for colonic or vaginal irrigations. Again, mineral water properly nebulized by mechanical means may be inhaled, in which treatment it reaches all parts of the respiratory tree. Its influence here, of course, may be local on the irritated membranes, or it may be general from the absorption of minerals or gases which are present in finely divided form in the vapors. Finally, and probably the most widespread method of application, is the internal use, whereby patients take varying amounts of mineral waters during a regular program of treatment at the resort or may follow their more regular use at home when the mineral waters are bottled for general distribution.

TABLE 9.—*Factors Which Determine the Effect Produced by the Use of Mineral Waters*

A. Temperature
B. Gravity—mechanical
C. Chemical constituents
1. Minerals
2. Gases
3. Reaction (alkaline)
D. Physical features

The technic and details of the administration of the mineral waters in the ways that have been described will be given more attention in the sections of this series dealing with particular disease conditions.

Physiologic changes which are brought about in the administration of mineral waters by any of the aforementioned methods may be outlined as in table 9. Harpuder[8] and Vogt[4] have reported the extensive studies made in this field.

A. *Temperature.*—This is an important factor in any hydrotherapeutic procedure, whether the person is using plain water or mineral water. In general, the extremes of temperatures, either hot or cold, are stimulating and, when temperatures beyond those which can be tolerated in either extreme are used, the destruction of the tissues will occur either from burning or from freezing. The use of neutral temperatures—those which feel neither hot nor cold to the patient—will not produce any definite temperature reaction. When one wishes to produce a temperature reaction which will directly influence the circulation and nervous system, then the degree of temperature either cold or warm is specified so that the reaction can be properly controlled. It is important here as with any other therapeutic agent to evaluate the physical status of the patient to determine whether or not he will tolerate the treatment to advantage. In other words, a person who is weak, rundown and suffering from low blood pressure and exhaustion will in general not tolerate the extremes of temperature, either hot or cold, but can best be treated with hydrotherapeutic applications in the neutral range. This holds true as well for mineral water as for plain water.

B. *Mechanical Effects.*—The mechanical effects of the application of mineral waters are dependent primarily on the specific gravity of the water itself. The strong brines, when used in baths, will produce greater pressure on the surface of the body than will lightly mineralized or plain water. This mechanical factor is of greater importance than usually considered by the physician who is prescribing baths. Its pressure on the lower extremities will aid in the venous return to the larger abdominal collecting veins. It will also aid the lymph circulation. When the abdomen is under water in the bath it exerts a pressure through the abdominal wall and will continue its aid to the returning venous circulation.

4. Vogt, H.: Lehrbuch der Bäder- und Klimaheilkunde, parts 1 and 2, Berlin, Julius Springer, 1940.
5. Strock, L. W.: Geochemical Data on Saratoga Mineral Waters Applied in Deducing a New Theory of Their Origin, Am. J. Sc. **239**: 857 (Dec.) 1941.
6. Baudisch, Oskar: The Importance of Trace Elements in Biological Activity, Am. Scientist **31**: 211 (July) 1943.
7. Baudisch, Oskar: The Importance of Trace Elements in Biologic Activity, J. A. M. A. **123**: 959 (Dec. 11) 1943.
8. Harpuder, Karl: Ergebnisse der experimentellen Balneologie: Ergebn. d. inn. Med. u. Kinderh. **42**: 100-155, 1932.

This pressure factor may work to the disadvantage of patients with dyspnea or cardiac disability if they are given a bath covering the entire chest and shoulders. The exertion of pressure over this portion of the body reduces to some degree the normal negative pressure developed in the pleural cavities during inspiration. This negative pressure is one factor which aids the satisfactory filling of the right heart. When it is diminished it may produce some difficulty in this filling and in patients who have a limited cardiac reserve it may produce definite symptoms. It is therefore customary for patients with these conditions to have the bath only to the lower border of the chest or, at most, to the middle of the chest.

The mechanical factor as expressed in the gravity or the concentration of the mineral waters is also important when they are used internally. Here they are usually described as either hypertonic, isotonic or hypotonic, dependent on the relation of their saline concentration to that found in blood serum. It is well known that mineral waters which are hypertonic will act in a manner similar to any hypertonic saline solution. They will cause a withdrawal of fluids from the body into the intestinal tract and result in more rapid and complete elimination of materials from the intestinal tract. If the mineral water is isotonic it will produce little, if any, fluid shift. If the water is hypotonic it will be more rapidly absorbed from the intestinal tract and generally result in increased elimination through the kidney. These general principles may be influenced somewhat by the nature of the chemical constituents in the mineral waters, but for the most part mineral waters will act according to the physical principles of any solution.

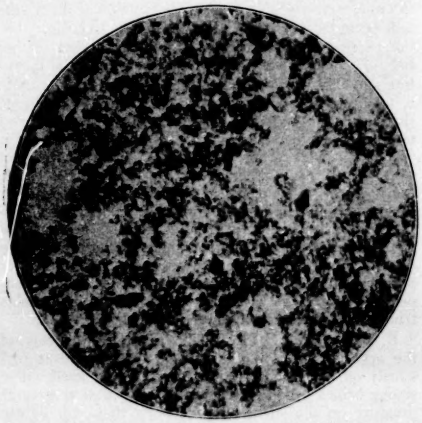

Fig. 1.—Mineral mud, conditioned by drying and milling, ready for therapeutic use. This and the accompanying photomicrographs are of some of the American peloids collected on a roving six months survey in the United States.

C. *Chemical Constituents.*—A consideration of the chemical constituents of mineral waters and their influence on physiologic processes would of course entail too great a discussion for the scope of this paper. When one considers the variety of minerals found in the various mineral waters, as well as the gases which are present, one can realize the multiple influences which they will produce in and on the body. The influence of mineral waters used in bathing will be determined in part by the nature of the gases present. In general, gases in solution, such as carbon dioxide, hydrogen sulfide and radon, will be absorbed through the skin

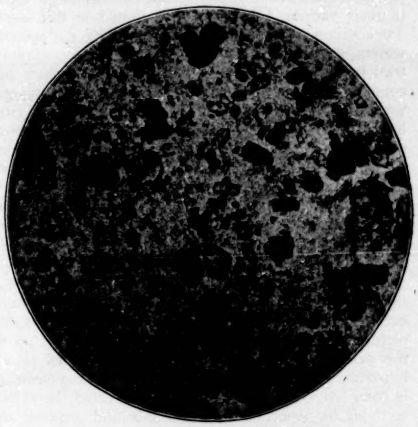

Fig. 2.—Sea mud or liman consisting of microscopic shells and detritus of seaweeds.

from the bath and produce effects internally. The absorption of other substances in solution from the baths has received considerable attention. There is some evidence that the halogens, particularly iodine and bromine, will be absorbed and also that substances like boron will pass from water containing them through the skin during a bath. The extent of this absorption and factors controlling its rate still require extensive study before definite statements can be made in this field.

When waters are taken internally, the dissolved or ionized minerals present are taken into the intestinal tract. Their absorption from the intestinal tract will be controlled by the general principles applicable to these various minerals when they are taken in any form. Certain minerals will form insoluble compounds in the intestinal tract and therefore are not readily absorbed. Others will remain more freely ionized and will be taken into the body more readily. The fact that practically all mineral elements found in the human body are present in some mineral waters indicates that many of the waters can be used to provide these elements when for any reason there is a mineral deficiency in the body. The physiologic studies of elements found in small amounts are still in their infancy, but the careful study of mineral waters is bringing forth information that the waters may be a source of some of these trace elements when they are not found in sufficient quantities in a person's diet.

In addition, the hydrogen ion concentration of the mineral water will indicate the extent of the free acid or alkaline ions. The presence of bicarbonate or carbonate salts in mineral waters will many times produce a considerable shifting in the acid base balance, so the mineral waters should be prescribed and taken with a knowledge of the shifts which occur.

The physical features of mineral waters which play their part in the therapeutic effect have been covered in the foregoing outline. Temperature, gravity or tonicity and the presence of carbon dioxide have been considered. The other physical properties influence more particularly the palatability of the water and indirectly, therefore, will determine to some extent the quantity which an individual patient may take. The fact that a water may be palatable to the taste, however, is no guaranty that one should take a greater amount of that water than some other. However, it does influence the amount of water which may be taken. Other physical factors play a minor role in the therapeutic result.

II. PELOIDS

Peloid is a generic name for substances which originate in nature by geologic process and which after certain methods of artificial processing can be applied as baths and packs in medical practice.

HISTORY

The medical use of muds and moors is ancient but not antiquated. Their use can be found depicted in mementoes of Assyrian, Babylonian and Persian medicoreligious ceremonies, and it is well known from old Latin scripts that aristocratic rheumatic Romans used the heated sea mud extensively in the palatial bath houses of ancient Rome (150 A. D.).

More than three hundred European spas were applying pelotherapy in 1935, especially in Czechoslovakia, England, Italy, France, Germany, Hungary, Norway, Russia, Rumania and Sweden.

Fig. 3.—California moor characterized by coarse débris of vascular plants.

To underscore the prestige pelotherapy enjoys in Europe, it is worthy of mention that in the early 1930's a state committee was founded by the Austrian government to register and analyze the Austrian muds. The places which they registered became state reservations.

The International Society of Medical Hydrology appointed a special committee for classifying, subdividing and nominating the different types of mud. The generic name "peloids" was agreed on by this committee under the chairmanship of Dr. S. Judd Lewis of England. Its classification of peloids, while highly scientific from the point of view of a geologist or a botanist, is too complicated even for specialists of medical hydrology. My recommendation in 1932 to this international committee was a simple one and is based on the diminishing silicate content of the manifold peloids. It is as follows:

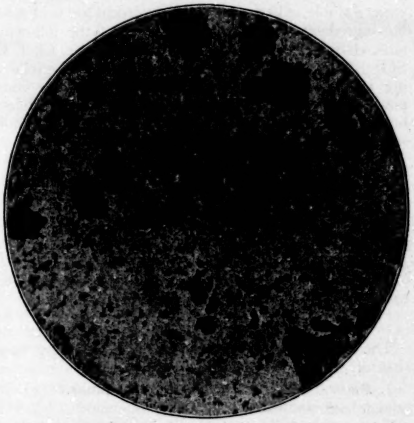

Fig. 4.—Mixed lake peat from Florida containing carbonized plant detritus and diatomaceae.

PELOID TYPES

1. Purely mineral (fango, mud).
2. Mainly mineral (sea mud or liman).
3. Mainly vegetable peloid (moor, peat).

1. Fango is a homogeneous, fine grained, nearly pulverized mud, collected from beds of mineral springs of volcanic origin (Italy, Rocky Mountains).[9]

2. Sea mud, or liman, is a mainly mineral mud, deposited on the bottom of shallow bays and inlets, containing microscopic shells of diatomea, fusillaria and spongilla needles, all of them cadavers of the "one cell life" of the ocean, mixed with quartz, sand and detritus of sea vegetation (New York, New Jersey, Sweden, Russia).[10]

3. Moors or peats, mainly vegetable muds, are the end products of an anaerobic humid moldering of marsh vegetation.[11] This process brings about the formation of organic acids, as formic, acetic, humic and resinous acids, in the ever growing and ripening marshy layers. Peat is characterized by its carbonized content of plant particles found in bogs (Germany, Florida, South California).

9. Behrend, H. J.: Fango Packs in Therapy, Arch. Phys. Therapy **17**: 501, 1936. Vrtiak, E.; Benson, S.; Kobak, D., and Carlson, A. J., Fango Treatment of Arthritis, Arch. Phys. Therapy **19**: 325, 367, 1938.
10. Schazillo: Der Einfluss der Limaubehandlung, Ztschr. f. phys. Therap. **33**: 67, 1927.
11. Engelmann: Sole oder Moorbader bei Frauenkrankheiten, Zentralbl. f. Gynäk. **21**, 1932. Vogt, H.: Grundsätzliches zur Moor- und Schlammbehandlung, Deutsche med. Wchnschr. **60**: 96 (Jan. 19) 1934.

PELOID CHARACTERISTICS

1. *Chemical Properties.*—The main bulk of mud is made up of sand, clay and kaolin; that of moors and peats of diatomaceae, algae, mosses and the débris of vascular plants; sea muds contain a mixture of minerogen and botanical constituents. Chemical analysis of water soluble, ether soluble and hydrochloric acid soluble ingredients displays the presence of the following ions, characteristic of muds: Si, Na, Ca, Fe, Cl, I, C, SO_4, SH. It also contains in minor quantity the following ions: Li, Mg, Mn, Al, Br. The organic components in limans, moors and peats consist of cellulose, humic acids, fats, waxes, tars, resins and estrogenic substances.

The reaction of muds is neutral.
The reaction of liman is alkaline.
The reaction of peats and moors is acid.

2. *Physical Properties.*—(*a*) High specific gravity. (*b*) Low specific heat. (*c*) Low heat conductivity (high heat retentivity). (*d*) Homogeneous dispersion of particles. (*e*) High plasticity, due to dispersion and colloids. (*f*) Radioactivity (volcanic muds).

MODES OF USE

The application of the so-called pelotherapy consists of:

1. *Baths.*—(*a*) In specially built bathtubs. (*b*) In mud pools—natural and artificial.

2. *Packs with Heated Mud.*—Mud baths are given extensively in European health resorts. Whereas both mud pools and mud tubs are practicable only near the finding place of the mud or in specially built institutions, mud packs can be given at any place, as the dry mud is easily transported.

To prepare a mud pack, the dry mud has to be mixed with about an equal amount of water and heated to about 60 C. It should cool down to about 45 C. and have the consistency of butter. The mud pack should be administered on a massage table or cot provided with a heavy woolen blanket, a rubber sheet and a coarse linen sheet, to be spread on the cot in the order named. The parts to be treated, often several joints or whole limbs, should be thickly covered with the hot mud, spread partly on the coarse linen, partly on the treated parts. Sheets and cover should be quickly wrapped around the body to prevent loss of heat. The patient remains one-half to one hour in the pack, which is followed by a cleansing bath and an hour's rest.

BIOLOGIC EFFECTS

The biologic effects of mud treatment are mainly due to its physical properties.

As the specific heat of the mud is much lower than that of the water, a temperature of even 50 C. can be well borne in hot mud (in plain water only about 44 C.).

Owing to poor heat conductivity, mud packs grow only slightly cooler during the generally protracted application. The number of calories transmitted per minute is lower than in water. Water of 33 C. feels indifferent to the skin. The mud packs feel indifferent at 38 C. The heat of the mud does not invade the skin vehemently but "sneaks" in (einschleichen).[12]

Important counterirritation of the skin is caused by the mechanical stimulation of the quartz grains, microscopic spicules, needles and shells. The plasticity of the mud enables it to be applied to any part of the body, giving a complete heat isolation to the treated parts. All these properties of the heated mud cause an extreme and deep passive hyperemia.

A considerable increase of the skin temperatures can be witnessed, as the result of stagnation in the venules. While the capillaries are opened and congested by this passive hyperemia caused by the heat, the pressure exerted by the heavy mud simultaneously compresses the lymph spaces and lymph vessels, evacuating their contents.

These skin effects elicit deep-seated changes: (1) increase of body temperature, (2) lowering of blood pressure and (3) influence on mineral metabolism and blood chemistry.[13]

The mud pack is a very effective form of conductive heat therapy, having an anodyne, absorption promoting decongestive effect.

INDICATIONS

The use of mud packs is mainly indicated in the local treatment of (1) chronic arthritis, irrespective of cause, (2) fibrositis, (3) neuritis, sciatic syndrome, (4) after-treatment of fractures and (5) sport and industrial injuries.

CONTRAINDICATIONS

1. Acute diseases and subacute stages of chronic diseases.
2. General physical debility and early convalescence.
3. Late stages of tuberculosis.
4. Severe peripheral vascular diseases.
5. Cardiac decompensation.
6. Gravidity.

COMMENT

An advantage of the mud treatments over electric treatments is that large surfaces, several joints, can be treated at one time, the pliable mud evenly surrounding whole limbs; an advantage over hot water baths is the higher point of indifference, which enables the patient to endure temperatures above 50 C. in the mud without paradoxical vasomotor reactions. The patient and his family can be taught to apply the heated mud in the home and so reinforce the efficiency of the usual office treatments in the aforementioned chronic disorders.

In my European Physical Therapy Institution, built above a mineral well, there was a tiled mud pool, 12 by 12 feet in dimension. The 3 foot deep mud on the bottom of it was transported in barrels from Pistany, Czechoslovakia, and Kolop, Hungary. It was heated to 90 C. with high pressure steam blown into the mass of mud through eight pipes from all directions before use. Tepid mineral water, 30 C., was used for the preparation of the mud bath in this pool. In this steam driven whirlpool bath of mud, where the floating mud particles slowly gave up temperature to the water, which gradually warmed up to 40 to 42 C., there was a strongly but pleasantly felt contrast effect between the initial tepidity of the water and the stinging heat sensation of the floating minute mineral mud particles. Used as preheating for high temperature mud packs and in the treatment of fibrositis, in which it worked as a low grade fever therapy, the mud pool was a very popular modality of treatment. Rectal temperatures of 103 F. were easily and pleasantly reached in thirty minutes in

12. Singer, C. I.: Effective European Methods of Hydrotherapy Neglected in United States, Arch. Phys. Therapy **17**: 631, 1936.

13. Bernstein: Ueber die Wirkung der Schlammtherapie auf die biochemischen Eigenschaften des Blutes, Ztschr. f. phys. Therap. **31**: 93, 1926. Brusilovski and Rubinstein: Das Blutbild nach Schilling bei Arthritikern unter dem Einfluss der Schlammbehandlung, Ztschr. f. klin. Med. **107**: 507, 1928.

this pool. The State Workers Insurance Fund had a contract with the institution through the Hungarian State Department of Labor for the treatment of its insured workers, disabled by chronic sickness or accident. The State Insurance Fund stated that its computed outlay for therapy and compensation in the rheumatic group of diseases diminished 23 per cent through two years' use of pelotherapy among the insured. This saving was achieved through shortened periods of disability among the workers.

To pass the expert's scrutiny as a medically useful peloid, the following is the list of some of the essential criteria:

1. It should be found in huge quantities.
2. It should be free of human contamination and pathogenic micro-organisms.
3. It should have uniformity of the material through the entire mud mine.
4. It should have a high degree of plasticity without adhesive properties (no stickiness).
5. It should offer an innate ease of processing.
6. It should be of low cost.

GENERAL CONSIDERATIONS

There is a vast array of chronic human ills of complex causation not amenable to surgery, resistant to routine medical curative efforts. The origin of these chronic ills is a puzzling, individual cross-web pattern of hereditary, habitual, environmental, emotional, social and occupational factors. Successively, coincidentally interwoven in these patterns of factors which determine the patient's physical welfare and longevity are the ravages done by infections, extreme and prolonged efforts and exposures of a lifetime. The organs of circulation, digestion and locomotion are the most vulnerable targets of these manifold exposures. While generally felt, it is not a crystal clear knowledge of the profession at large that the early appearance of these chronic degenerative and inflammatory processes could be prevented and that, if they occur, their medical handling requires the same long range planning as that of tuberculosis or syphilis. In this long range planning of the therapy of chronic diseases the spa regimen with its scientifically planned and medically supervised vacationing of four to six weeks' duration, involving a climatic change, a strict regulation of the diet and activities, and judicious use of the natural therapeutic agents, has a definite role for which there is no substitute.

Rehabilitation.—In periods of commercial stimulation, psychotic and psychoneurotic patients have found placement in industry in greater ratio than at other times. There is no question but that there are thousands of such individuals in mental hospitals who could be economically rehabilitated were they provided more adequate opportunities for employment. In the average mental hospital, many patients reach the point at which they could work satisfactorily in an environment in which there are provided a minimum amount of encouragement, direction and supervision. The gap between leaving the protective atmosphere of the hospital and the harsh realities of the outside job situation is too wide. The new environment, the new readjustments, competitive situations, the increased tempo of activity may produce a regressive desire to retreat from an insecure situation and return to the hospital. On the other hand, some hospital systems provide "boarding out" arrangements through which the patient lives in private families and gradually readjusts himself to the demands of work and society.—Davis, John E.: Principles and Practice of Rehabilitation, New York, A. S. Barnes & Co., Inc., 1943.

Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT. AUSTIN E. SMITH, M.D., Secretary.

THE COUNCIL ON PHARMACY AND CHEMISTRY

MEMBERSHIP, ACTIVITIES, METHOD OF OPERATION, ATTAINMENTS

AUSTIN E. SMITH, M.D.
CHICAGO

During these days of proposed revision, increasing enforcements by administrative bodies and other restrictions which seem to be a sign of the times, it is refreshing to observe how a body with no legal power can create changes with far reaching effects. In the past thirty-nine years there has been no single body which has created as much change in the practice of therapeutics as has the Council on Pharmacy and Chemistry. The Council was organized in 1905 to serve the medical profession and the public by providing accurate information on the status of agents used in the treatment of disease. Since that time its activities have grown, and as it enters its fortieth year in 1944 the members can look back with satisfaction on the service that has been provided. Even though the Council is an integral part of the American medical profession, many members profess confusion regarding Council makeup and activities. It is to dispel some of this confusion that this paper is offered.

MEMBERSHIP

The Council consists of seventeen outstanding scientists, each associated with some recognized medical center, and a Secretary who is a full time employee of the American Medical Association with an office in Chicago. The members are David P. Barr, professor of medicine, Cornell University Medical College; J. Howard Brown, associate professor of bacteriology, Johns Hopkins University School of Medicine; S. W. Clausen, professor of pediatrics, University of Rochester School of Medicine and Dentistry; Harold N. Cole, clinical professor of dermatology and syphilology, Western Reserve University School of Medicine; Morris Fishbein, Editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION; E. M. K. Geiling, professor of pharmacology, University of Chicago School of Medicine; Robert P. Herwick, chief, Drug Division, U. S. Food and Drug Administration; Chester S. Keefer, Wade professor of medicine, Boston University School of Medicine; Eugene M. Landis, professor of physiology, Harvard Medical School; James P. Leake, medical director, Epidemiological Section, National Institute of Health; George W. McCoy, professor of preventive medicine and public health, Louisiana State University School of Medicine; Perrin H. Long, professor of preventive medicine, Johns Hopkins University School of Medicine; Stuart Mudd, professor of bacteriology, University of Pennsylvania School of Medicine; E. M. Nelson, chief, Vitamin Division, U. S. Food and Drug Administration; W. W. Palmer, Bard professor of medicine, Columbia University College of Physicians and Surgeons; Elmer L. Sevringhaus, professor of medicine, University of Wis-

consin Medical School, and Torald Sollmann, professor of pharmacology and dean, Western Reserve University School of Medicine. Many others will be remembered for their long association with Council activities and scientific contributions. Since the Council's organization on Feb. 11, 1905 there have been appointed sixty members. The average tenure of membership has been eleven years.

The members of the Council serve without remuneration but freely give a large amount of their time and effort to the Council's work. This work cannot be estimated purely in terms of hours per week, as every afternoon or evening sacrificed by a Council member for consideration of some Council problem means the loss of that time for some other urgent problem which may relate to his family or the institution with which he is connected.

The Council on Pharmacy and Chemistry has served as a model for the Council on Physical Therapy and the Council on Foods and Nutrition of the American Medical Association and for the Council on Dental Therapeutics of the American Dental Association. There is at the moment no successful counterpart outside the United States, although representatives from several countries recently have visited the Council office to learn the details of Council functioning so that similar bodies can be established in these other countries when the time seems propitious.

ACTIVITIES

In addition to considering proprietary drugs the Council reviews the status of other agents which the medical profession, and even the public, may be urged to use, publishes reports on claimed advances in the use of medicinal preparations, with the Chemical Laboratory elaborates standards on drugs introduced into materia medica, provides information for physicians, members of the armed forces and others, sponsors the publication of several books and numerous research projects, and maintains a cooperative relationship with many governmental and nonofficial organizations. Its information and advice are frequently sought; it is often invited to participate in cooperative projects with other agencies. It does not hesitate to initiate an investigation when a grievous error occurs in the manufacturing and dispensing of drugs; a few such instances are well known to all. The Council also maintains cooperative relationships with many countries other than the United States, and much correspondence is exchanged on problems of mutual interest.

The publications sponsored by the Council include New and Nonofficial Remedies, Useful Drugs, Epitome of the U. S. Pharmacopeia and National Formulary, Annual Reprint of the Reports of the Council, and Glandular Physiology and Therapy. It also supervises the preparation of the Intern's Manual. By the end of 1943 well over 400,000 copies of Council publications had been distributed over the last twenty year period. Of this number New and Nonofficial Remedies comprised about 260,000 copies.

The Council has assumed ever increasing importance in the field of medicine until now it is truly considered one of the leading authorities on rational therapeutics. There are few who are not familiar with the Council's seal, and yet there are many who have only the vaguest conception of how this seal is issued.

PROCEDURE FOR ACCEPTANCE

The use of the seal is restricted to those products which have been found acceptable for inclusion in New and Nonofficial Remedies, a yearly publication of the Council. The Council considers articles for listing in this book according to a set of rules which permit consistent and fair application for all firms and their products. The rules essentially provide that an accurate statement of composition must be provided; suitable tests must be available for identification; the article cannot be advertised either directly or indirectly to the public unless it is one of those agents information on which the Council feels may be made available to the public (for example, first aid measures, laxatives, vitamins); statements regarding origin and source of raw material must not be misleading; therapeutic claims shall not be exaggerated or misleading; the label must list the active substances; the name under which the product is sold shall not be misleading or suggestive of diseases or therapeutic indications; patent numbers and trademarks, if any, must be furnished, and the preparation must not be unscientific.

Obviously it is the right and duty of the physician to know the essential composition of the drugs he prescribes. He also wishes to know if the mixtures are unnecessarily complex, being mindful of the fallacy of prescribing unnecessary potent agents and prescribing routinely several drugs of different actions in fixed proportions in one preparation. The physician also is justified in demanding that the claims offered on behalf of a product which he is urged to use should be in line with demonstrable facts. The value of such rules is self evident. When the Council insists that manufacturers keep their advertising material within the limits prescribed by Council rules, it serves to protect the public and the physician.

Some manufacturers more interested in self gain than in the welfare of the public or the physician formerly used the doctor as a means of promoting their medicine to the public. The technic was simple: Promoters were convinced that the easiest way to establish a demand for their goods on the part of the public was to make available a catchy name, especially if it was suggestive of a disease or treatment, and advertising material which could be read by the curious patient and his friends and relatives. The late Dr. Simmons referred on more than one occasion to an article on proprietary medicines which was published in an advertising journal; this read in part "But the patent medicine of the future is the one that will be advertised only to doctors. Some of the most profitable remedies of the present time are of this class. They are called proprietary medicines. The general public never hears of them through the daily press, for their publicity is secured through the medical press by means of the manufacturer's literature." This statement appeared in print almost forty years ago, and yet it is still admirably descriptive of some present day promotional practices.

PROPRIETARY NAMES

The profits to be made by a pharmaceutical house from the sale of a drug which is offered under an official name usually is quite moderate. The profits to be made from the sale of the same drug sold under a proprietary name is frequently enormous. For example, a survey in the September 1941 issue of a popular price list of drugs revealed that the total cost of an ounce of each of nineteen substances under a protective name was $48.67, whereas the total cost of an ounce of each

of these substances under a nonprotected name was $15.67; thus, the cost of a proprietary name to the consumer would be $33. This represents retail price, the material being reduced to terms of ounces for convenience. Included in these nineteen agents were sedatives, vasoconstrictors, local anesthetics, anti-infective agents and analgesics. Some years ago a large hospital in an eastern city adopted a set of specific regulations which, in effect, did away with the expense of prescribing proprietary agents when official counterparts were available, and unnecessarily complex mixtures and the absurd practice of prescribing names instead of therapeutically active agents. This pharmacy within one year effected a saving of $50,000. Thus the manufacturer frequently considers it of prime importance that his product be endowed with his own protective name.

With the desire of encouraging the introduction of drugs that are an advance over those previously known, the Council does not offer objection to the application of a proprietary, exclusive name, provided the drug to which it is applied really presents something new. Thus the Council recognizes such names for products not previously known, for substances previously known but not used in medicine, for unique and worth while variations for making this drug available, and when a known substance is found to have new value, even if that substance was used in the practice of therapeutics at an earlier date. Obviously the new value has to be worth while. If a manufacturer will read the Council rules, he will know if his new product merits recognition under a proprietary name and if the chosen name is acceptable. However, he frequently spends several years promoting the agent without regard for the rules and then feels offended if the Council will not accept the agent under the proprietary name. How simple it would be if the manufacturer would place the name before the Council when the product is ready for the market (and even before it is ready for the market) and ask the Council to consider its acceptability in the event the product is submitted to the Council for inclusion in N. N. R. If any changes are necessary they can be made easily at the time of this preliminary consideration with no inconvenience or expense for the manufacturer. The present trend is to do this.

One of the greatest evils of the use of protected names lies in the confusion they create. The old story of methenamine being prescribed in one prescription under six different names is a standing joke in materia medica classes, and yet other examples just as questionable are evident in everyday practice. In the United States the practice among the better pharmaceutical drug manufacturers seems to be decreasing, partly because these organizations are acquiring critical medical and other technical personnel and partly because experience shows a certain amount of resentment on the part of the medical profession; there is a greater tendency to reserve proprietary and protected names for specialties of the house rather than for official agents. However, there is still room for much improvement.

It is interesting to observe the nomenclature situation in an allied country, England. There, sulfanilamide is offered under fifty odd names, including Antistrept, Astreptine, Bacterimide, Bactericide, Cepticide, Erysipitan, F1162, PABS, Septinal, Strepamide, Streptamide, Streptosal and Therapol. Can any one hope to memorize fifty such names, none of them chemically descriptive, for one agent? Sulfapyridine is sold or prescribed under nine different names, sulfathiazole under seven. Even the *Lancet*, an English publication which must depend a great deal on advertising for financial security, presented an editorial in August 1943 entitled "Babel in the Drug Trade." This editorial reads, in part, "It is questionable whether the British drug trade in its present form makes the most of its great opportunities for public service. The war has revealed unexpected deficiencies. . . . particularly disappointing is the attitude of parts of the trade towards the canons of ethical nomenclature . . . the Council on Pharmacy and Chemistry of the American Medical Association very rightly refuses to recognize proprietary names for articles which are included in their Pharmacopeia and National Formulary. In the marketing of original articles they say 'The legitimate interests of the producer are fully served by identifying such product by appending the name or initials of the manufacturer, or by use of a general brand mark.' The same must be true over here."

The Council has met many arguments in its consideration of the nomenclature problem. In some instances there were honest differences of opinion; in others arguments were motivated solely by commercial reasons. And yet, in spite of these arguments it is interesting to notice that the names which have been coined or adopted by the Council as nonproprietary names have come into popular use, are listed in the U. S. P. or are recognized by judicial bodies as the common name. Excellent examples are arsphenamine, procaine, cinchophen, viosterol, chiniofon, menadione, sulfanilamide, sulfapyridine, sulfathiazole, riboflavin and thiamine hydrochloride.

Frequently representatives of manufacturers inform physicians that their product is not accepted "simply because of the name." As a result some physicians feel there is much unnecessary ado about nomenclature. Examination of the Council's past considerations (this is possible because every item of correspondence and other activities has been preserved and bound since 1905) refutes this unjust criticism and proves the fairness of the principles in the preceding paragraphs. In the past twenty years only eighteen articles have been rejected primarily because of the manufacturer's refusal to abandon a proprietary name which was in conflict with Council rules. Included were four tetraiodophenolphthalein sodium preparations, two bismuth suspensions, one barium sulfate suspension, one colorless tar preparation and one liquid petrolatum.

REFEREE'S CONSIDERATION

Admission of an article to N. N. R. does not imply a recommendation or "approval." It merely means that no conflict with the rules has been found by the Council and that the product has merit as a therapeutic agent. All products are submitted in accordance with certain rules. The firm must provide specimens of advertising material, specimens of the drug for laboratory examination, evidence in support of the efficacy and proposed claims, information on trade name and synonyms, definition, preparation, properties, tests, pharmacologic action, therapeutic indications, toxicology, dose, how supplied, manufacturer, patents and trademarks.

The Council office submits the firm's data, with other information in its files, to a Council member who serves as a referee. The referee prepares a report or puts in finished form a rough draft, which may have been prepared in the Council office by a consultant, and returns it to the Secretary, who, every two weeks, transmits such material to the other Council members by a mimeographed bulletin. Accompanying this report are speci-

mens of advertising material and other pertinent material which may aid the Council members in their decisions. Thus, each Council member has an opportunity to judge for himself the usefulness of the product, whether it complies with the Council's rules, and the report offered by the referee, who, incidentally, is an authority in the field of the subject which he is asked to consider.

In the next issue of the Bulletin to Council members appears the discussion by all members which may elicit information not available to the Council office or the referee. In the following issue of the Bulletin appears the vote to accept the product, reject or hold in abeyance. A three-fourths affirmative vote of the voting members (a nonvoting member being one who may be ill, temporarily out of the country or otherwise occupied) is necessary for the acceptance or rejection of a product. If a product is accepted the firm is notified immediately of the outcome of the Council's consideration. If any advertising claims must be revised or deleted or more supporting evidence provided before the product stands finally accepted, the firm is so notified. On the removal of these conditions the product then becomes accepted and a description is submitted to the editor of THE JOURNAL for publication and subsequent transferral to New and Nonofficial Remedies. If insufficient evidence is submitted by the manufacturer to justify the acceptance of its product at the time of consideration, the manufacturer is notified so that he may submit the lacking information. If he refuses or is unable to do so the product may be held in abeyance for further investigation or be immediately rejected. The manufacturer always is given opportunity to argue the Council's decision and may at any time ask the Council to reconsider the status of a rejected product.

Occasionally there is brought to the attention of the Council a new product which shows promise of usefulness but on which the experimental work has not been sufficient to make it ready for general use by the medical profession. In order to assure proper and controlled clinical study of such a product the Council issues a preliminary report on identity and standards, on the experimental work that has been done and on the further study that may appear desirable.

With the exception of the continuance of acceptance of a drug, all the Council's actions, whether of acceptance, rejection or omission, are published in THE JOURNAL and later in New and Nonofficial Remedies or in the Annual Reprint of the Reports of the Council on Pharmacy and Chemistry. This gives full publicity for all the Council's decisions to manufacturers and physicians alike.

The Council insists that the manufacturer must supply evidence for therapeutic and other claims. The Council is not equipped to initiate a clinical investigation of every drug that is submitted for its consideration. It does have the facilities of seventeen Council members to draw upon, the members' associates and other outstanding authorities throughout the entire country, these men serving gladly as Council consultants. A chemical laboratory maintained at A. M. A. headquarters examines the chemical composition of every submitted product before it is admitted to New and Nonofficial Remedies. Sometimes a manufacturer offers inadequate evidence to the Council when his product is submitted. Needless to say, this question of submitting evidence has been the cause of much confusion in the past and undoubtedly the cause of some criticism of the Council by certain manufacturers. It is anticipated that from now on this difficulty will approach a minimum, because the outline by which each product is presented demands that the evidence must accompany the presentation. A scheme has been set up whereby well defined steps must be followed by the manufacturer when he presents his product so that all necessary data are available at one time for the Council's consideration. These steps are outlined in a booklet of rules which is available on request.

OFFICIAL DRUGS

Official agents and combinations of official agents are exempt from Council consideration if they are marketed with no unestablished claims and under the official name or synonym. Undoubtedly there are many who have noticed that N. N. R. contains official agents as well as nonofficial ones. This is because the Council feels that there are many official agents about which the medical profession is not sufficiently well informed, and since the U. S. P. does not provide statements of actions and uses the Council makes these available in N. N. R., Useful Drugs and the Epitome of the U. S. P. and N. F. Each year N. N. R. is revised so that the claims are in line with those generally accepted at the time of revision. Such yearly revision provides a book to which the physician may turn for authoritative and up-to-date information on the therapeutic value of drugs. Three years after acceptance each product is reviewed to determine if it is still in keeping with the Council's rules; if it is, the agent is accepted for another three years. At the end of each interval of three years, or more often, it is reexamined.

The agents described in the official compendiums (U. S. P. and N. F.) and New and Nonofficial Remedies total in number about 2,700. The U. S. P. lists approximately 650 articles, the National Formulary 730, and New and Nonofficial Remedies describes 1,300 agents. Without an actual count of the index cards which have been kept since the Council's inception in 1905 it has been estimated that the Council has probably considered from 250 to 400 products every year, thus providing an examination and evaluation of about 15,000 products in the last thirty-nine years. In addition, it has given consideration, not with the view to acceptance or rejection but for the purpose of making status reports, to probably 2,000 or more articles. U. S. P. XII and First Supplement will include about 114 agents previously described in N. N. R. and for which the Council had already provided standards. The articles described in the two official compendiums U. S. P. and N. F. and in N. N. R. provide an array of useful agents from which any medical practitioner may prescribe, regardless of his specialty. These books include almost all the useful drugs which are on the market; certainly they list all known agents which are essential to the practice of medicine. Of course, new drugs are developed, and as they are developed the Council watches closely their progress. When a firm submits a new one it is given immediate consideration by the Council. Sometimes the firm does not submit a product for various reasons, in which case the Council may initiate a report so that proper information may be available for the medical profession.

MISREPRESENTATIONS BY "UNACCEPTED FIRMS"

Some may wonder why certain firms do not stand "accepted" by the Council. Some of these firms have no products accepted simply because they have not asked for Council consideration. Others do not have accepted products because their policies have not yet been brought into conformance with Council requirements.

However, a number of new firms were included in N. N. R. in the past two years, and several more will probably be listed within the next few months. All these firms have taken it upon themselves to change their line of products and advertising policies. Old outmoded mixtures are being discarded for new, truly effective agents. Misleading and therapeutically suggestive names are being replaced by official or descriptive names. Advertising policies are becoming more conservative so that the physician can feel reasonably certain that the promoted claims are within reasonable bounds of accuracy. At present there are about 150 firms with products accepted by the Council.

Representatives of a few firms whose method of doing business has not resulted in recognition by the Council have in some instances made untrue representations to the effect that the Council charges a fee for examining drugs or that it "costs too much" to get a product passed by the Council, or that it is necessary to take out so much advertising in THE JOURNAL before the Council will accept a product. Such statements are completely false. The Council has never accepted, or permitted to be accepted, a cent of remuneration in any form for the consideration of products. The cost of the Council on Pharmacy and Chemistry, as well as that of the other A. M. A. councils, is borne entirely by appropriations made by the Board of Trustees of the American Medical Association. The Council is not influenced in the slightest by any proffer of advertising patronage; Council members are not advised by the Secretary of any information with respect to a proffer of advertising and there is no possibility of their action being influenced by where a product is advertised. If the Secretary learns of such a proffer, the firm is notified that it will have no effect on the Council's consideration. If any such charges against the Council reach the members of the profession, they should demand immediately that such charges be either substantiated or retracted.

DRUGS SOLD TO THE PUBLIC

Sometimes the Council is asked why it does not consider for acceptance more agents sold to the public. In the first place, such an undertaking would be a tremendous one. No one body of moderate size could ever hope to give consideration to all the agents that come and go. Of greater importance is the status of claims offered to the public; are such agents sufficiently effective to meet all the claims advanced? If they are this effective are they the kind of preparations that should be in the hands of medically untrained individuals? The evils of self diagnosis and self treatment are self evident.

ACCEPTABILITY OF COUNCIL RULES

Considering that the Council has no legal power, its power being only that derived from the press, enthusiastic followers and use of the seal, manufacturers on the whole are fairly good Council supporters. This has been evident even from the beginning, when the Council first adopted a set of rules and sent them to the manufacturers for comment. Most of the replies were favorable, some even enthusiastic—an indication that the aims of the Council were essentially similar to those of the higher class of pharmaceutical manufacturers. A few were openly antagonistic, but this antagonism bore almost a direct correlation with the practices of the firm. Torald Sollmann said in 1908 "The Council is bound to conflict with the commercial element where this element conflicts with scientific progress; the manufacturers on the other hand must keep an eye on the dividends. . . ." It is interesting to note that the rules adopted by the Council in 1905 are essentially those in operation today, the only differences being editorial improvements and minor changes and additions which have been necessary from time to time to clarify the rules. After these rules had been in operation for half a year the Council arranged for a conference with the representatives of large manufacturing houses for an open discussion. This should be an answer to those who may ask if the Council's rules are sufficiently lenient. Apparently the manufacturers were satisfied at that time with the rules, and certainly consistent application over thirty-eight years has resulted in fairness for all. The Council has been and still is ready to consider carefully any suggestions for the improvement of these rules or of any activity in which the Council may be engaged.

DELAY IN COUNCIL ACTION

Occasionally the Council is criticized on the ground that it takes too long in its deliberations. This criticism deserves comment: Prolonged delays are almost invariably due to failure on the part of a manufacturer to submit the things for which he assumes full responsibility, for example, evidence or revised advertising claims. A product which is submitted with all necessary information and which does not violate the Council's rules can be accepted within a period of from six to ten weeks—surely not a very serious delay. If necessary, as when a manufacturer wishes his product Council accepted prior to bidding in certain contracts, or when a hospital or other body is anxious to have an immediate report, the Council can, by means of special Bulletins, complete consideration within two or three weeks. However, this is not a procedure that can be followed frequently, as it would upset the routine which has been found most effective to dispose of Council considerations.

Occasionally short delays are created by the referee being pressed at the moment with other duties. But as soon as these are removed the referee turns immediately to the Council problem. If he desires to prove or disprove certain claims by actual trial in his laboratory or clinic, a further short delay may result; but obviously such experimentation is of benefit to the physician and even the manufacturer submitting the questioned claims. The Council members assume a grave responsibility in declaring a product acceptable or nonacceptable, and they demand that the necessary data for careful consideration be available.

Sometimes manufacturers who have not had experience with the Council fail to understand what constitutes adequate evidence. The kind of evidence which the Council wants is that which will stand up before any critical examining body, the kind which a scientist would not be ashamed to present before a medical or other scientific group. Signed statements, even when they come from the best of men, do not constitute evidence if they are merely testimonial in character; several hundred signed testimonials are not equal to one or two good pieces of research.

OTHER QUESTIONS

Some critics have averred that the average physician is capable of judging the value of a product. Unquestionably he is trained to observe clinical responses. But

has he the time and the necessary detailed knowledge of bacteriology, pharmacology, toxicology, endocrinology and other special branches of medicine always to determine which patients might have recovered without drug intervention, which preparations are unnecessarily complex, which contain agents that are incompatible, which may have lost part of their effectiveness because of partial absorption into the container or by oxidation and the host of other factors that must be considered? Many of the manufacturers with products accepted by the Council would be the first to say no. Each member of the Council has spent many years of special study in some particular field and is able to give more accurately and more quickly answers to questions concerning Council submitted products.

The Council occasionally is asked if there is need for its existence with the new food and drug legislation. The answer is "yes." In the consideration of a new drug application the Food and Drug Administration under the terms of the 1938 Federal Food, Drug and Cosmetic Act is permitted to examine solely from the standpoint of safety. If this body attempts to question certain claims in the proposed advertising material it may be reminded by the manufacturer that advertising material not accompanying the market package is outside the jurisdiction of the Food and Drug Administration. Any action based on the consideration of claims for usefulness must be initiated on interstate shipments after a new drug application has been made effective.

Several considerations render it impossible for the Food and Drug Administration to consider the labeling and to determine the composition of all types of drug products after they have appeared on the market: first, limitations of the facilities and personnel made available for the enforcement of the Food, Drug and Cosmetic Act; second, the attention the Food and Drug Administration must give to the small segment of the industry that will always be engaged in the manufacture of products with wholly fraudulent or even vicious claims, and, third, the large number of pharmaceutical manufacturers and the tremendous number of products marketed. Furthermore, the Food, Drug and Cosmetic Act is applicable only to products in interstate commerce and many products do not go beyond the borders of the state in which they are manufactured. Unfortunately altogether too many state enforcement agencies have inadequate facilities for control of these products. Under these circumstances for a considerable volume of therapeutic agents which the physician uses, the only definite assurance he has that the labeling claims for them are in accordance with sound medical opinion is the appearance on the package of the seal of the Council on Pharmacy and Chemistry.

The Federal Trade Commission cannot exert the necessary control over medical advertising directed to the physician, as the act under which it operates for all practical purposes exempts the drugs so advertised. The Post Office Department acts only on complaints and then reserves its action for schemes in which the mails are used for fraudulent purposes. Usually, articles mailed to the public are involved. The National Institute of Health is concerned only with serums, vaccines, toxoids and analogous products in which are included certain antisyphilitic preparations. Other agencies, judicial and nonjudicial, are concerned mostly with protecting the public.

What other organization, then, is there to aid the medical profession in its consideration of drugs which it is importuned to use? And what agency can move as fearlessly as the Council on Pharmacy and Chemistry and obtain such immediate, militant and effective support as can be provided by THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and the state medical journals?

According to some of the letters reaching the Council office, it appears that many physicians believe a nonacceptable product to be satisfactory simply because the Council has not issued a report of rejection. The Council has made no attempt to report on all unacceptable products, but it can and is prepared to issue very many more reports of rejection if necessary. It wishes to avoid such action if possible, as the more logical approach to the problem in which cooperation is desired and needed is to point the "do's" rather than the "don'ts." All of us are dealing with human individuals, few of whom like to be pushed, while many desire to be led.

ATTAINMENTS

The proprietary medicine business is essentially a development of the last seventy years. Nostrums placed on the market in the seventies and patented German synthetics became enormous in number in the early part of this century. Profits were immense and enticing. While a few of the compounds were of distinct value, the vast majority were simple mixtures of well known drugs put out under fanciful copyrighted names and for the most part fraudulent in one way or another; many were actually dangerous. Some were products from well known drug houses; the majority were put out by men who knew nothing of drugs or their effects but who went into the business of manufacturing medicines as they would any other business. Few hired competent chemical or medical advice, and as a result no statement was too silly or claim too extravagant. Those with a critical eye should have seen through the flimsy material offered as "evidence," but by persistent and occasionally clever advertising many were duped into buying and using these mixtures. Truly in these earlier days medicine in some instances could have been defined by the disappointed patient and physician as "the act or science of amusing a sick man with frivolous speculations about his disorders, and of tempering ingeniously until nature either kills or cures him." As early as 1879 the Association adopted resolutions condemning the use of these secret and semisecret mixtures, but it remained for the Council on Pharmacy and Chemistry to ferret out the acceptable and unacceptable agents for the physician and journal advertising pages. The job was a tremendous one and encountered much opposition in the early days. However, by earnest and altruistic effort the Council members brought about a semblance of order in the existing chaos.

Many of the original objectives of the Council have been firmly established, partly because of the increasing appreciation of its work by the medical profession, partly because of the position it holds as a consultant body, partly because of the more conservative and scientific attitude of the average drug manufacturer. As a result the commercial production and distribution of medicinal products is on a higher plane in the United States than in any other country. But there is still a

long way to go; there must be close cooperation by all branches and representatives of the profession. If the advertising pages of medical journals are closed to medicinal agents which are not official or listed in N. N. R. there will be a powerful incentive for manufacturers to reach much more quickly the Council objectives, which are those of rational therapeutics. "Pharmaceutical manufacture is largely a business; and as such it will be ready to defer to the demands of its customers—the medical profession." To be completely effective, such a program must be participated in by every one interested in progressive medicine, not by just a few or others who may be part time participants according to their momentary interest. Otherwise the Council's efforts are stultified; representatives of the medical profession should be the Council's strongest supporters.

An interesting observation is the degree to which the public has become Council conscious. The Council office not infrequently has inquiries from physicians asking if a product is Council accepted simply because their patients have made such inquiries. Many people in lay audiences that are addressed by members of the headquarters staff ask about Council acceptance in a manner that indicates considerable familiarity with the Council and its seal. Any physician who fails to observe Council acceptance when he prescribes drugs for these persons is placed in an embarrassing position.

COOPERATION

A letter from the editor of a medical journal which was published in THE JOURNAL in 1913 reads, in part, "I do not believe that you realize just what the conditions are in the smaller communities . . . the question of supporting the Council on Pharmacy and Chemistry is . . . one which merits more consideration than we have given it. I do not believe that we are justified in making such strenuous efforts to reform the daily press and protect the public until after we have cleaned up our medical journals and made an effort to protect the public from the evils of incompetency and dishonesty. . . . So far as I am personally concerned I am through with temporizing, and the 'kid glove' manner of handling the vital subjects. I propose to hit the nail on the head when I know that I am right. It is a little hard for the average editor to look over the advertising income and do the right thing at the expense of the purse, but I think the medical profession should be given to understand that such effort is to be supported or else the medical profession should cease to own and operate medical journals."

If the various representatives of medical and other scientific groups are prepared to support the Council's efforts, they can provide much aid. Many hospitals purchase only official and N. N. R. drugs. Many medical journals accept for advertising only official and N. N. R. drugs. Many teaching centers suggest only these agents with the exception of others offering much experimental promise. The Council's work can be brought to the attention of those apart from teaching centers and modern hospitals by appropriate journal editorials and other articles, which must be repeated frequently to be most effective, by discussions on the Council and other A. M. A. bodies at medical meetings, by reproduction in medical journals and elsewhere of Council pronouncements and by restriction of advertising of drugs in medical journals to official and N. N. R. drugs.

The members of the medical profession desire truthful information on drugs in which they may be interested. This is evident in the letters arriving at the Council office. To determine the source of this interest the letters arriving since the first of 1943 have been examined for point of origin. This examination failed to reveal any direct correlation between free distribution of N. N. R. to medical students and inquiries (which might be expected, as probably not more than 50 per cent of students remain in the state in which they graduate) or between number of physicians in each state and the number of inquiries from that state. The number of inquiries from the seven states with the least number of physicians was found to be 1 inquiry per 1,200 physicians over any given period; in the seven states with the greatest number of physicians the inquiries totaled 1 per 400 physicians—a threefold increase. Perhaps this enormous increase bears a fairly direct relation to the amount of educational activities carried on within the state.

The degree of education regarding Council functions lies entirely in the hands of those who are interested sufficiently to further this education; there seem to be increasingly receptive audiences—there is definitely an increasing interest by the majority of scientific bodies. This interest occurs not without reason and should be fostered by every one anxious to achieve the utmost in rational therapeutics.

535 North Dearborn Street.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

THEOPHYLLINE ETHYLENEDIAMINE (See New and Nonofficial Remedies, 1943, p. 357).

The following product has been accepted:

G. D. SEARLE & CO., CHICAGO

Tablets Aminophylline: 0.1 Gm.

SULFATHIAZOLE SODIUM (See New and Nonofficial Remedies, 1943, p. 190).

The following product has been accepted:

LEDERLE LABORATORIES, INC., NEW YORK

Ampul Solution Sodium Sulfathiazole 25% W/V: 10 cc.

DIPHTHERIA TOXOID, TETANUS TOXOID, ALUM PRECIPITATED, COMBINED (See New and Nonofficial Remedies, 1943, p. 549).

The following dosage form has been accepted:

PITMAN-MOORE CO., INDIANAPOLIS

Combined Diphtheria-Tetanus Toxoid, Alum Precipitated: 1 cc. and 10 cc. vials in packages of two 1 cc. vials and of one 10 cc. vial. Preserved with 1:10,000 merthiolate.

SOLUTION OF EPINEPHRINE HYDROCHLORIDE 1:100 (See New and Nonofficial Remedies, 1943, p. 267).

The following product has been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Solution of Epinephrine Hydrochloride 1:100: 5 cc. Contains epinephrine hydrochloride 1 per cent, chlorobutanol 0.5 per cent, sodium bisulfite 0.3 per cent and sodium chloride in isotonic solution.

SULFADIAZINE (See New and Nonofficial Remedies, 1943, p. 169).

The following dosage form has been accepted:

E. R. SQUIBB & SONS, NEW BRUNSWICK, N. J.

Sulfadiazine *(Powder):* 4 oz. and 1 lb. packages.

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SATURDAY, FEBRUARY 12, 1944

NOTES ON HUMAN TOXOPLASMOSIS

In the course of his work on malarial and other hematozoa, Laveran [1] observed that Brazilian and Tunisian strains of the protozoon that came to be known as Toxoplasma were alike not only in form and mode of reproduction but also in pathogenic action. This action extended to many species of mammals and even birds. In this country Sabin and Olitsky [2] studied the intracellular parasitism of Toxoplasma and established the pathogenic and immunologic identity of different strains fatal to mice, guinea pigs, rabbits and chickens but not to Rhesus monkeys, the serum of which on recovery was found to have antitoxoplasmic properties.

In relation to human toxoplasmosis, Wolf, Cowen and Paige made morphologic studies in distinctive cases of granulomatous encephalomyelitis in infants, in the lesions of which were protozoon organisms. In 1939 they [3] demonstrated the etiologic agent in such cases to be Toxoplasma by transmitting the infection from a typical case in an infant to rabbits and mice. At the same time Sabin [4] showed that human and animal strains of Toxoplasma were identical. Wolf and his associates have reported several well observed cases of toxoplasmic encephalomyelitis in infants. Toxoplasma may cause encephalitis and other lesions in older children [5] and visceral involvements in adults.[6] The 2 cases of adult toxoplasmosis observed by Pinkerton and Henderson in Missouri simulated the clinical and cutaneous phenomena of the typhus-spotted fever group. Toxoplasmosis, infantile and adult, has just been reported from rural districts in Brazil.[7] Another case of infantile toxoplasmosis is reported from Detroit.[8] The wide distribution of the scattered cases of human toxoplasmosis suggests that the disease may be more frequent than is now recognized.

As yet the mode of transmission in animals and man of toxoplasmic infection is not known. In the infantile form of toxoplasmosis the advanced nature of lesions at birth, often calcified and associated with structural defects, point to prenatal infection. Evidences of active disease with the presence of protozoa have been found in the bodies of stillborn infants. While the serum of mothers of such children may contain antitoxoplasmic bodies, there is no record of active maternal disease in any of the cases, and the mechanism of the fetal infection also remains wholly unknown. Apparently it might result from a latent or inapparent infection of the mother. Close examination of the placenta may help to solve the problem. Latent toxoplasmosis occurs in animals, and the suggestion has been made that further search for evidences of latent human toxoplasmosis should be conducted along the lines of the work by Sabin.[5]

The characteristic lesions in the nervous system in the infantile form of toxoplasmosis are of a chronic, granulomatous, nonsuppurative nature with necrosis and calcification, hydrocephalus and a typical bilateral chorioretinitis.[9] In the clinical diagnosis, consideration must be given to the signs of cerebral injury, to the x-ray evidence of calcification and hydrocephalus and to the ophthalmoscopic examination for chorioretinitis. The protozoon itself, a microscopic, crescentic, pyriform or oval organism with a chromatin mass, may be demonstrable in smears of exudate and in sections of the granulomatous tissue. The organism may occur singly, intracellular or free, as well as in rounded aggregations or pseudocysts. Toxoplasmosis can be produced in guinea pigs, mice and rabbits by the injection of infectious materials—exudate, cerebrospinal fluid, blood—from the patient. The serum of the patient may contain antitoxoplasmic bodies.[10] Infantile toxoplasmosis is usually fatal within a few weeks after birth, but patients have survived up to four years or so, though with mental deficiency and epileptiform convulsions. The 8 year old boy observed by Sabin [5] recovered completely, beginning with the tenth day.

Enough has been said to indicate the outlines of the knowledge gained in the last few years of human toxoplasmosis, a protozoan infection not previously recognized. In this rapid advance the work by Wolf and his

1. Phisalix, Marie: Laveran, Alphonse: La vie, son oeuvre, Paris, Masson & Cie, 1923, p. 77.

2. Sabin, A. B., and Olitsky, P. K.: Toxoplasma and Obligate Intracellular Parasitism, Science **85:** 336 (April 2) 1937.

3. Wolf, Abner; Cowen, David, and Paige, Beryl H.: Human Toxoplasmosis: Occurrence in Infants as an Encephalomyelitis; Verification by Transmission to Animals, Science **89:** 996, 1939. Toxoplasmic Encephalomyelitis. IV. Transmission of Infection to Animals from a Human Infant, J. Exper. Med. **71:** 187 (Feb.) 1940.

4. Sabin, A. B.: Biologic and Immunologic Identity of Toxoplasma of Animal and Human Origin, Proc. Soc. Biol. & Exper. Med. **41:** 75, 1939.

5. Sabin, A. B.: Toxoplasmic Encephalitis in Children, J. A. M. A. **116:** 801 (March 1) 1941.

6. Pinkerton, Henry, and Weinman, David: Toxoplasma Infection in Man, Arch. Path. **30:** 374 (July) 1940. Pinkerton, Henry, and Henderson, R. G.: Adult Toxoplasmosis: A Previously Unrecognized Disease Entity Simulating the Typhus-Spotted Fever Group, J. A. M. A. **116:** 807 (March 1) 1941.

7. Two New Cases of Human Toxoplasmosis, Brazil Letter, J. A. M. A. **124:** 252 (Jan. 22) 1944.

8. Steiner, G., and Kaump, D. H.: Infantile Toxoplasmic Encephalomyelitis: Report of a Case, J. Neuropath. & Experiment. Neurol. **3:** 36 (Jan.) 1944.

9. Koch, F. L. P.; Wolf, Abner; Cowen, David, and Paige, Beryl H.: Toxoplasmic Encephalomyelitis. VII. Significance of Ocular Lesions in the Diagnosis of Infantile or Congenital Toxoplasmosis, Arch. Ophth. **29:** 1 (Jan.) 1943.

10. Sabin, A. B.: Toxoplasma Neutralizing Antibody in Human Benign and Morbid Conditions Associated with It, Proc. Soc. Biol. & Exper. Med. **51:** 6 (Oct.) 1942.

associates has been of fundamental significance. Many questions arise. How about the frequency and nature of other forms of toxoplasmosis than the congenital or the infantile? How is the disease acquired? How can it be prevented and how can it be treated successfully? Is there a chronic form of human toxoplasmosis as suggested by Weinman?[11] Are there carriers of Toxoplasma?

MUST PREPAYMENT FOR MEDICAL SERVICE BE COMPULSORY? THE WAGNER-MURRAY-DINGELL BILL: IV

The basic argument for compulsory sickness insurance is the financial one—that the cost is with certainty distributed in time and over a larger body of people. Compulsory sickness insurance, according to such evidence as is available from other countries, inevitably deteriorates the quality of medical service by spreading it more and more thinly to meet the financial resources and polluting it by politics. Admittedly, like all insurance, it spreads the expense of unanticipated illness.

Can the fundamental objectives of spreading expense be attained without compulsion? The House of Delegates of the American Medical Association has repeatedly adopted resolutions encouraging state and county medical societies to organize experimental prepayment plans. Many such plans—at least twenty—several of them statewide, are now in operation or in process of organization. The first was begun about six years ago; now approximately a million members are receiving medical care through such plans.

Prepayment plans for hospitalization, also endorsed by the House of Delegates, have expanded in a decade to nearly every state and now include some fifteen million members. Medical society prepayment plans have cooperated with hospital plans as well as with the Farm Security Administration, Social Security, Care of the Indigent, Federal Housing Projects and Industrial Medical Plans. The functioning of these relationships has not always been smooth, nor have relations with other agencies been without occasional friction. There have been conflicts, mistakes and disagreements. Those who think that compulsion removes difficulties will be quickly undeceived by a glance at the volumes of legislation, litigation and regulations that have sought to patch defects in compulsory systems. Medical society prepayment plans have also had their administrative and financial difficulties, but at least the prepayment plans under auspices of medical societies seldom permit the medical service to deteriorate in quality. Medical society plans concentrate on the minimum interference with mutual free choice between physician and patient.

Prepayment plans are still experiments—compulsory no less than voluntary; both are evolving and changing. Compulsory plans are anchored to financial, administrative and political considerations, to which the quality of medical service must be made to conform. Medical society prepayment plans make good medical care the stable element to which all else must be adjusted. Medical society plans grow and develop with the progress of medicine and the health needs of the public. Compulsory plans are imposed by forcible revolution, fixed by law and changeable only through political pressure. The vested interests which they create and protect are those of partisan politics. The health of the public and the progress of medical art and science seem to be secondary to administrative considerations, notwithstanding the protests and iterations of legislators that they are concerned only with the delivery of medical service. Had they been so concerned they would at least have consulted with the medical profession as to possible technics by which the desirable objectives could be secured.

11. Weinman, David: Chronic Toxoplasmosis, J. Infect. Dis. **73**: 85 (July-Aug.) 1943.

FETAL ERYTHROBLASTOSIS AND THE Rh FACTOR

Rarely has a medical discovery been so quickly and so widely accepted as has the significance of the Rh blood factor. Almost immediately after the first report[1] of its discovery the new factor aroused general interest far beyond the narrow circles of investigators especially interested in blood grouping. At present, only four years later, the term Rh factor not only has become a part of the medical vocabulary but has achieved the distinction of being discussed in the lay press.

This rapid recognition no doubt is due to the circumstance that the new blood factor has helped to solve two baffling medical problems, namely the so-called hemolytic and sometimes fatal intragroup transfusion reactions[2] and the genesis of fetal erythroblastosis.[3] Both have now been shown to result from the immunization of Rh negative persons by Rh positive blood. This immunization may be produced by the transfusion of Rh positive blood or during pregnancy. In pregnancy an Rh negative mother is assumed to receive Rh positive blood from the fetus, which the latter has inherited from his Rh positive father. In either case an Rh negative person, thus immunized, may not tolerate Rh positive blood, although it is otherwise of the same blood group as his own.

Anti Rh agglutinins as produced by immunization of the mother may pass through the placenta to the fetus, damage its blood corpuscles and bring about hemolytic anemia with its sequelae: erythroblastemia, jaundice and edema; that is, fetal erythroblastosis. In other words,

1. Landsteiner, Karl, and Wiener, A. S.: An Agglutinable Factor in Human Blood Recognized by Immune Serums for Rhesus Blood, Proc. Soc. Exper. Biol. & Med. **43**: 233 (Jan.) 1940.

2. Wiener, A. S., and Peters, H. R.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Groups, with 3 Cases in Which the Same Agglutinogen Was Responsible, Ann. Int. Med. **13**: 2306 (June) 1940.

3. Levine, Philip; Katzin, E. M., and Burnham, Lyman: Iso-immunization in Pregnancy: Its Possible Bearing on the Etiology of Erythroblastosis Fetalis, J. A. M. A. **116**: 825 (March 1) 1941.

the mechanism of erythroblastosis fetalis depends on isoimmunization of the mother by the Rh factor in the blood of the fetus, which thus may jeopardize its mother in the event of transfusion, and on the intrauterine action of anti Rh agglutinin on susceptible fetal blood. This explanation of the relation of the Rh factor to erythroblastosis is supported by statistical, immunologic and clinical evidence, and there can be little doubt as to its essential validity.

RUSSIAN SURGEONS AND RUSSIAN SURGERY

The reports of the individual members of the Anglo-American Surgical Mission to Russia agree in their impressions of the people, the surgeons and the surgical military service of the Soviet Union. Watson-Jones [1] states that during his three weeks stay in Moscow he did not observe any signs of malnutrition in the adults or any evidence of rickets in the children. His first impression was the overwhelming hospitality of the Russians; the second was the astonishing capacity of Russian women for hard work. Women doctors, women surgeons and nurses work in the front line; many of them wear the chevrons of multiple wounds. The inspector general of the medical service of the Red Army is a woman.

Members of the mission thought that the organization of the surgical service was superb. A distinctive feature is the principle of segregation of patients. This is begun almost at the front line. After the patient has been admitted to the front line hospital he is referred to orthopedic, neurosurgical, thoracoabdominal, lightly wounded or other wards. Each ward is equipped with its own x-ray and operating suite; treatment by skilled specialists is instituted within 10 to 20 miles of the front lines and within twenty-four to forty-eight hours after wounding. The principle of segregation is carried beyond the specialist wards of the sorting-evacuating hospitals to specialized hospitals farther behind the line. So great has been the flow of casualties that it has even been practicable to devote 2,000 bed hospitals to gunshot wounds of the thigh, to penetrating wound of the hip joint and to other special injuries. Watson-Jones felt that the blood donor system of Moscow is worthy of emulation. It is a model of careful organization, of the highest possible standard of operating room asepsis and of repeated check and control of both contamination and accurate blood grouping.

While surgical principles are much the same everywhere, some differences in the detail of their application was found. Yudin practices excision of the wound regardless of the time limit or the state of infection. He excises all necrotic tissue and keeps the wound wide open by suturing the skin to the deep fascia. No tube, drain or gauze pack is placed in the wound. The closed plaster technic is used for all major wounds, compound fractures and joint injuries. In treatment of joint wounds many surgeons prefer resection of the joint to arthrotomy. Sulfonamides are used, and the limb is immobilized in a plaster cast.

The hospitals for cerebral surgery have on their staff a neurosurgeon, a neurologist, a neuropathologist, an ophthalmologist, an otorhinologist and a radiologist. The patients are transported by air at heights not greater than 5,000 meters. Operation is deferred until skilled surgeons and equipment are available. Expert study and operation two or three days after wounding are considered better than inexpert operations performed immediately.

Watson-Jones also lists such innovations as ultrasonic emulsification of therapeutic agents, intracarotid injection of sulfonamides, intracisternal injection of antitetanic serum, cap splints for maxillary fractures, gap fractures of long bones, acrylic resin for dentures (which are delivered many miles behind enemy lines), plastic reconstruction of the penis by tube grafts and cartilage inlays, producing an organ capable of both urination and erection, and the treatment of esophageal stricture by jejunal transplants. The astonishing fact is that so high a standard of surgery has been achieved in a country where full development is so young and where contacts with the surgery of other countries have been so limited. The Russians have, of course, their great surgeons as well as their poor ones. The mission was rather impressed by the vast scale on which surgery is done in Russia. Thus Yudin performed for the visitors in one morning three operations of replacement of esophageal stricture by jejunum.

Watson-Jones concludes that the Russian surgeons have nothing fundamental to learn from us, nor we from them. He believes that Soviet surgeons would gain from visits to other countries; in this way their technic would be improved; but he believes with equal conviction that the mission gained from its visit to them. The Anglo-American surgeons did not approve of all they saw; they disagreed with the Russians on the treatment of frostbite; they were unconvinced of the merit of muds, balsams and wood distillates; they thought that our rehabilitation is better than the Russians'; but much of the Soviets' work is better than ours: Their specialization is excellent; their training of medical students is thorough; their organization of surgical services is superb. The efficiency of their organization, with its emphasis on specialization, is probably one of the reasons why the Russians return 70 per cent of their wounded to the firing line. Another factor may be the toughness of the Russian constitution. According to Penfield [2] psychoneurosis is rare in the Soviet Union, for they have an ample supply of its specific antidote, high morale.

1. Watson-Jones, Reginald: Russian Surgeons and Russian Surgery, Bull. War Med. (Medical Research Council) **4**: 121 (Nov.) 1943.

2. Penfield, Wilder: The British-American-Canadian Surgical Mission to the U. S. S. R., Canad. M. A. J. **40**: 455 (Dec.) 1943.

Current Comment

FORTY YEARS OF SERVICE TO THE MEDICAL PROFESSION

This week the Council on Pharmacy and Chemistry enters its fortieth year of service to the public and the medical profession. Since its first meeting on Feb. 11, 1905 the Council has fought continuously for rational therapeutics. It has created much change in the practice of therapeutics. Its activities and decisions are highly respected and are followed internationally by leading medical authorities; its advice is sought frequently by administrative, advisory and educational bodies in this country and in others. Elsewhere in THE JOURNAL (p. 433) is a communication outlining the membership, activities, method of operation and attainments of the Council on Pharmacy and Chemistry. Undoubtedly this will be of interest to all, and of special interest to those who have been the more ardent Council supporters. It is fortunate indeed for the public and the medical profession that there exists an unselfish body such as the Council which can give scientific consideration to rational therapeutics and issue its statements without fear or favor.

THE KIDNAPING OF SUN YAT-SEN

Four celebrated physicians played an important part in an incident which had great influence on the history of China. The story is related by Dr. Sze in the *Chinese Medical Journal*.[1] The four men concerned are Sun Yat-Sen, the first president of the Chinese Republic, Sir Halliday Macartney, Sir Patrick Manson and Sir James Cantlie. Sun Yat-Sen arrived in London on Oct. 1, 1896, an exile and a fugitive from China after an abortive attempt at a revolutionary uprising. He was tricked on October 11 into entering the Chinese legation, where he was locked up and preparations were made for his shipment back to China and execution. Fortunately for Sun Yat-Sen, he succeeded in having a message sent to Sir James Cantlie, apprising him of the situation. Cantlie engaged the assistance of Sir Patrick Manson and of the foreign office, so that when the representative of the latter called at the Chinese legation on October 23 to demand the release of their prisoner this was immediately complied with by Sir Halliday Macartney, the English secretary of the Chinese legation. The career of Sir Patrick Manson, the "Father of Tropical Medicine," is too well known to require comment. That of Macartney and of Cantlie are perhaps less well known to the American profession. Cantlie joined Manson in 1887 in the practice of medicine in Hongkong. During his nine years of practice there he founded the Peak Hospital, the Vaccine Institute, the Hongkong branch of St. John's Ambulance Brigade and the Hongkong College of Medicine. The very first student to matriculate in that college was Sun Yat-Sen. Cantlie's researches were particularly on leprosy, plague, liver abscess and sprue. During the plague epidemic of Hongkong in 1894 Cantlie worked with Yersin and thus shared in the investigations which resulted in the discovery of the plague bacillus. Cantlie returned to London just a few months before the kidnaping of his former student, in whose rescue he was to play the leading part. Sir Halliday Macartney began his career as a British army surgeon in the Peking expedition of 1860. He soon acquired knowledge of the Chinese language, married a Chinese woman and later left his medical career to enter the service of the Dragon Throne. He played a prominent part in peace negotiations between General Gordon and Li Hung-Chang. In 1876 Macartney was made English secretary of the Chinese legation in London, in which position he served twenty-nine years. The growth of the republic of China may be traced to the success of this famous kidnaping.

1. Sze, Szeming: Four Doctors and a Famous Kidnapping, Chinese M. J. **61**: 172 (April-June) 1943.

OVARIAN INSUFFICIENCY

Female hypogonadism is generally classified into primary hypogonadism, due to ovarian insufficiency associated with a secondary increase in production of gonadotropic hormones, and secondary hypogonadism, in which ovarian insufficiency is secondary to the decreased production of gonadotropic hormones. A method suitable for the clinical determination of the urinary levels of gonadotropic hormones was developed by the Hellers[1] and has now been used by Klinefelter, Albright and Griswold[2] in the reinvestigation of the problem of ovarian insufficiency. The normal levels of daily urinary excretion of follicle stimulating hormone, established in a control group of 35 normal persons, were found to vary between 6.6 and 53 mouse units. Values below and above these figures were interpreted as due to decreased and increased production of follicle stimulating hormone respectively. On the basis of these excretion levels three different types of hypoestrinism were recognized. The first group includes primary ovarian insufficiency with lack of estrogens and consequent increased production and excretion of follicle stimulating hormone. The second type is represented by pituitary hypoestrinism due to primary deficiency in the production of follicle stimulating hormone and consequent association of estrogen lack with decreased urinary excretion of gonadotropic hormone. The third category includes patients in whom ovarian insufficiency is accompanied by normal values of follicle stimulating hormone in the urine. On the basis of present knowledge, the finding of this association of low estrogen level with normal gonadotropin production is unexpected and difficult to interpret. Since pure follicle stimulating hormone is unable to produce estrogen excretion in the absence of luteinizing hormone, a deficiency of the latter hormone was postulated to account for the ovarian insufficiency in this group. Further, since there is evidence to indicate that the release of luteinizing hormone is

1. Heller, Carl G., and Heller, Emily J.: Gonadotropic Hormone: Clinical Application of Extraction Methods for Assay Purposes, Endocrinology **24**: 319 (March) 1939.

2. Klinefelter, A. F., Jr.; Albright, Fuller, and Griswold, G. C.: Experience with a Quantitative Test for Normal or Decreased Amounts of Follicle Stimulating Hormone in the Urine in Endocrinological Diagnosis, J. Clin. Endocrinol **3**: 529 (Oct.) 1943.

under the control of the hypothalamus, these cases have been tentatively classed as hypothalamic hypoestrinism. Confirmation of this hypothesis must await demonstration of an actual hypothalamic defect and also development of adequate methods for the separate clinical assay of the luteinizing and the follicle stimulating factors.

COMPLEMENT FIXATION TEST FOR VENEREAL LYMPHOGRANULOMA

Attempts to develop diagnostic aids for venereal lymphogranuloma have been concentrated on the skin reaction usually called the Frei test and the complement fixation test. Although there have been many favorable reports on the Frei reaction, others [1] have not been satisfied with this test. Adherents of the complement fixation method, Grace and Rake now report that antigens made from lymphogranulomatous nodes or pus are unsatisfactory for the performance of this test because of their low content of virus; however, a new yolk sac antigen consisting of a suspension in isotonic solutions of sodium chloride of the elementary bodies of the virus can be prepared with any desired concentration of virus. They employed antigens of this type on 202 persons with a variety of clinical conditions, finding the reaction positive in the serums of 130 and negative in those of 72 persons. Comparisons with the Frei test, according to these observers, indicated that the complement fixation test is more sensitive than the Frei reaction and does not involve the difficulties of comparing the diameters of papules as the skin test requires. Grace [2] suggests that this test be named after Rake, who is, he says, responsible for its introduction in its present valuable form.

PHARMACY TEACHING STANDARDS

Ordinarily the course in pharmacy requires thirty-six months spread over four years. As a wartime measure the degree can be obtained in three years (by eliminating vacations). This acceleration appears to be in keeping with that for other scientific curriculums. Recently leaders in the pharmacy profession considered a proposal for an acceleration which would permit a degree in twenty-four months. The proposal was emphatically rejected by the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. These bodies apparently feel that immediate corrective measures for any momentary shortages are not as important as a long range policy which will permit maintenance of present standards and an assurance of well qualified pharmacists in the years to come. The action of these bodies seems to be in conformance with the thoughts expressed by representatives of the majority of pharmacy schools and colleges and by those vitally interested in the welfare of pharmacy as a profession.

1. Grace, A. W., and Rake, Geoffrey: Complement Fixation Test for Lymphogranuloma Venereum, Arch. Dermat. & Syph. **48**: 619 (Dec.) 1943.

2. Grace, A. W.: The Chick Embryo Antigen (Lygranum) Test for Lymphogranuloma Venereum, Arch. Dermat. & Syph. **48**: 659 (Dec.) 1943.

POSTOPERATIVE PAIN IN TOTAL PNEUMONECTOMY

Postoperative pain following total pneumonectomy is considered by Johnson [1] to be an important contributing factor in the production of cardiorespiratory complications. It acts (1) by preventing a normal rate and rhythm of respiratory movements, (2) by preventing the patient from lying on the operated side, thus hindering the dependent drainage of the secretions from the remaining lung, and (3) by restraining cough, thus allowing mucus to accumulate in the tracheobronchial tree. As a result, the patient will suffer from anoxia, such complications as cardiac failure, atelectasis, drowning in the infective secretions of the lung or from a a bronchopleural fistula, shift of the mediastinum toward the remaining lung will be produced or aggravated, and therapeutic measures to counteract these complications impeded. Since morphine sedation is accompanied by the hazard of further respiratory depression, simple crushing of the intercostal nerves in the areas surrounding the incision is recommended by Johnson.[2] In 10 cases in which this simple procedure was performed, an area of anesthesia resulted, making it possible for the patient to lie on the operated side to allow dependent drainage, to maintain deep, even respirations, insuring normal pulmonary ventilation, and to cough out secretions from the tracheobronchial tree.

PSYCHOMETRIC STUDY OF SENILITY

According to Halstead,[1] systematic, standardized mental measurement in old age is in the early stages. Halstead is studying senile patients in two London hospitals and describes the methods and results of a special study of 20 patients, 68 to 83 years of age, the less seriously demented of a larger group of subjects. In this study twenty-five short tests, requiring about one hour for each patient, were used. These tests are submitted as "a tentative battery for a further investigation of senescence." Halstead points out that mental tests for senility must be short "because of straying attention, impaired comprehension and short retention" of the subjects. The details of his tests cannot be given here, but some of the main results may be quoted. The subjects tested "found it difficult to reverse old habit sequences, to retain visual and auditory material of a meaningful kind, and showed impairment in such qualities as judgment, planning and spatial discrimination. They were somewhat better at rote memorizing and in fluency of old associations. They showed up best on immediate recognition (visual), early acquired habit patterns and simple motor tasks." The value, practical as well as scientific, of work like Halstead's is obvious, and the outcome of continued studies of the mental changes in advancing years will be awaited with much interest.

1. Johnson, Julian: Postoperative Pain Following Total Pneumonectomy: I, J. Thoracic Surg. **12**: 697 (Dec.) 1943.

2. Johnson, Julian: Postoperative Pain Following Total Pneumonectomy: II, J. Thoracic Surg. **12**: 702 (Dec.) 1943.

1. Halstead, H.: A Psychometric Study of Senility, J. Ment. Sc. **89**: 362 (July-Oct.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

COURSE TO TRAIN OFFICERS FOR DUTIES OF ASSISTANT BATTALION SURGEONS

The first six week class of the School for Medical Administrative Corps Officers began training recently at the Medical Replacement Training Center, Camp Barkeley, Texas, to qualify officers for the duties of assistant battalion surgeons serving in battalion aid stations. Located a few hundred yards to the rear of the battalion in combat that it supports, the station receives and treats slight wounds and renders emergency treatment, such as the administration of blood plasma, to seriously wounded casualties. The principal purpose of the battalion aid stations is to supervise quick evacuation of the seriously wounded by litter to the rear. Under command of the battalion surgeon, each station is in the charge of an assistant battalion surgeon, who at present is a first lieutenant or captain, M. C.

The course is being given in an effort to relieve thousands of medical officers for duties more demanding of their complete professional knowledge and is the first of its kind designed by formal instruction to train officers specifically for this work. The courses will include instruction only in technical, medical and surgical work and that which will fit the officers for their duties at the aid stations. The large majority of the allotted hours will cover field medicine and surgery, with other subjects, including sanitation and tactics, and shorter periods devoted to logistics and administration. The subjects will be treated practically, with as much application as possible. Classes in the field medicine course will include anatomy and physiology, bandaging and dressing, splints and emergency treatment. Miscellaneous hours will include transportation of casualties, transfusions, chemotherapy and penicillin, tropical diseases, immunization and the care of psychiatric casualties. Brig. Gen. Roy C. Heflebower is commandant of the school.

MAJOR THOMAS C. BRANDON AWARDED LEGION OF MERIT

The War Department recently announced the award of the Legion of Merit to Major Thomas C. Brandon "for exceptionally meritorious conduct in the performance of outstanding service as surgeon of the Eritrea Service Command in the organization and operation of a medical service in the occupied enemy territory of Eritrea from February 5 until June 1942 and later as surgeon of the Levant Service Command, Services of Supply, United States Army Forces in the Middle East. Major Brandon, under the most trying circumstances and without adequate medical facilities, succeeded in maintaining the health of several hundred American civilian employees operating in the Eritrea and Palestine areas in addition to caring for the military personnel. In a strange country where climatic and sanitary environment is detrimental to the average American, Major Brandon, unaided by any other medical officer or suitable assistants, in addition to caring for this unusual number of personnel, established a preventive sanitary program which succeeded in preserving the health and working ability of all American personnel in these areas. His expert professional attainments, energy and untiring efforts aided immeasurably to the state of health and morale of the command." Dr. Brandon formerly lived in Williamsport, Pa., and graduated from Jefferson Medical College of Philadelphia in 1935. He entered the service in March 1941.

GENERAL HOSPITALS DESIGNATED FOR SPECIALIZED TREATMENT

Paragraphs 3 and 5 in circulars issued by Headquarters Army Service Forces Nov. 23 and Dec. 17, 1943, regarding general hospitals designated for specialized treatment, are amended in Circular No. 31, dated January 27, and read as follows:

"Individual patients in a station or general hospital who require specialized treatment of a type provided in a general hospital designated for such specialized treatment will be transferred to such general hospitals after direct communication between the two hospitals has insured the availability of a bed. Whenever possible such cases will be sent to the general hospital nearest the patient's home which provides the specialized treatment required.

"Authority to issue orders transferring such patients from a station hospital or from one general hospital to another may be delegated by the service command headquarters to the commanding officers of the posts, camps or stations and the commanding officers of named general hospitals. In such cases the service commands concerned will be furnished information copies of all orders so issued."

GOLD WINGED BADGE FOR ARMY AIR FORCES FLIGHT NURSES

The War Department announced on January 18 the adoption of a gold winged badge for flight nurses of the Army Air Forces which is similar to the flight surgeon's wings except that it is smaller and consists of the combat observer's badge with the insigne of the Army Nurse Corps superimposed in the center. These wings have been authorized for wear by nurse graduates of the School of Air Evacuation, Bowman Field, Ky., who have been assigned to flight duty. Five hundred have graduated since the flight nurses' training program was begun a little more than a year ago. Flight nurses now are serving with Army Air Forces' air evacuation units in all major combat zones, as well as with units assigned to global air transport routes. They take care of the wounded, sick and injured soldiers being evacuated aboard transport and cargo planes.

ARMY PERSONALS

Major Cornelius O. Bailey, Los Angeles, was appointed surgeon general of the Military Order of the World Wars at the national convention held recently in Cincinnati. Dr. Bailey will fill the position formerly held by Col. Joseph M. Heller, who died recently. The Military Order of the World Wars is a patriotic organization whose membership consists of commissioned officers of both world wars.

Dr. John E. Elmendorf, until recently of the Rockefeller Foundation, International Health Division, was given a leave of absence for the duration of the war to accept a commission as lieutenant colonel in the Army Medical Corps and is in charge of professional activity and personnel in the Army School of Malariology, Quarry Heights, Canal Zone. Dr. Elmendorf is a well known malariologist with twenty years of activity in the prevention and control of malaria and yellow fever. He has promoted health laws, conducted field research and instituted projects for the control of tropical fevers in Costa Rica, Guatemala, Venezuela and Brazil. At the time he was commissioned last December he was in charge of a school of malariology for the Army and Navy officers in the Pensacola area.

MISCELLANEOUS

CHOICE OF STUDENTS BY DEANS OF MEDICAL SCHOOLS

The Directing Board of the Procurement and Assignment Service urges that if at all possible the 20 per cent of places not covered by Army and Navy contracts in classes entering medical schools after Jan. 1, 1945 be filled with students who on graduation will not be obligated for military service: that is, with women and men physically disqualified. This is the only group that can be depended on to serve as replacements for physicians in civilian practice.

Only in case a school does not have a sufficient number of acceptable applicants in this category to fill these places should the number of Army and Navy students accepted exceed 80 per cent. It is urged also that decision to accept more than 80 per cent of students from the armed forces be postponed until the latest possible date.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 5, p. 370)

COLORADO

Memorial Hospital, Colorado Springs. Capacity, 87; admissions, 2,814. Edward Rowlands, Superintendent (2 residents).

ILLINOIS

St. Anthony's Hospital, Rock Island. Capacity, 150; admissions, 3,357. Mother Mary Christopher, Administrator (1 resident).

MICHIGAN

St. Lawrence Hospital, Lansing. Capacity, 185; admissions, 6,897. Sister Mary Assisium, Superintendent (3 interns).

WARTIME GRADUATE MEDICAL MEETINGS

Among the subjects scheduled for early presentation under the auspices of the Wartime Graduate Medical Meetings are, at Camp Kilmer, N. J.: Head Injuries, Their Diagnosis and Treatment, Dr. Temple Fay, March 13; Management of the Anesthesia Period, Dr. Frederick P. Haugen and Lieut. Comdr. Don Hale, March 27.

At the Naval Hospital, Philadelphia: Obstructive Lesions of the Urinary Tract and Their Relationship in the Production of Renal Pathology, Dr. Joseph Birdsall and Capt. J. R. Waterman, March 3; Physical Therapy, Lieut. Comdr. Jacob L. Rudd, March 17; Psychosomatic Aspects of Cardiovascular Disease, Dr. Edward Weiss and Lieut. M. M. Pearson, March 31.

At Indiantown Gap, Pa.: Psychiatric Contributions to Medicine, Dr. Kenneth Appel, March 2; Psychosomatic Aspects of Gastrointestinal Disorders, Dr. Edward Weiss, March 9; Management of the Anesthesia Period, Dr. Frederick Haugen, March 16; Anesthesia: A. Spinal Anesthesia; B. Intravenous Pentothal, Dr. Henry S. Ruth, March 23; Treatment of Syphilis, Dr. Francis G. Harrison, March 30.

At Fort Monmouth, N. J.: Digitalis, Dr. William D. Stroud and Capt. Solomon J. Selikoff, March 1; Peripheral Vascular Disorders, Dr. David W. Kramer, March 8; Treatment of War Wounded in Naval Hospital Physical Therapy Department, Lieut. Comdr. Jacob L. Rudd, March 15; Short Wave Diathermy Treatment, Dr. William H. Schmidt, March 15; Ultraviolet Therapy, Dr. A. A. Martucci, March 15; Treatment of War Wounded in Naval Hospital Physical Therapy Department, Lieut. Comdr. Jacob L. Rudd, March 22; Posture, Physical Exercise and Massage, Dr. Leonard D. Frescoln, March 22; Diabetic Complications, Dr. Joseph T. Beardwood Jr., March 29.

At England General Hospital, Atlantic City, N. J.: Chemotherapy (Sulfonamide and Penicillin), Dr. Hobart A. Reimann, February 22; Yellow Fever, Dr. William D. Sawitz, March 7; Low Back Pain, Dr. Paul C. Colonna, March 21.

OFFICE OF WAR INFORMATION INAUGURATES SHORT WAVE RADIO BROADCASTS TO OVERSEAS AUDIENCES

The Office of War Information inaugurated the first of a series of short wave radio broadcasts to overseas audiences by prominent American medical and public health authorities on January 31. Dr. Thomas Parran, Washington, Surgeon General of the U. S. Public Health Service, was the first speaker. The series is entitled "Health Is on the March" and will describe recent medical and health advances made in the United States and other United Nations. Those who will be featured on succeeding programs are Dr. James E. Paullin, Atlanta, Ga., President of the American Medical Association; Dr. Herbert Edwards, New York, director of the Bureau of Tuberculosis, New York City Department of Health; Dr. Selman A. Waksman, New Brunswick, N. J., microbiologist, New Jersey Agricultural Experiment Station, and professor of microbiology at Rutgers College; Dr. Henry E. Meleney, New York, professor of preventive medicine, New York University School of Medicine; Dr. L. T. Coggeshall, Ann Arbor, Mich., chairman, Department of Tropical Medicine, University of Michigan Medical School; Dr. Henry E. Sigerist, Baltimore, professor and director of the Institute of the History of Medicine, Johns Hopkins University, and Dr. Theodore Rosenthal, New York, director of the Bureau of Social Hygiene, New York City Department of Health. Although the talks will be made in English, the Office of War Information Overseas Branch will broadcast translated versions in many languages.

DR. JAMES A. CRABTREE APPOINTED ACTING CHIEF OF THE HEALTH DIVISION OF UNRRA

Herbert H. Lehman, Director General of the United Nations Relief and Rehabilitation Administration, recently announced the appointment of Dr. James A. Crabtree as acting chief of the Health division of UNRRA. Dr. Crabtree graduated from the University of Tennessee School of Medicine, Memphis, in 1925 and took postgraduate work in public health at Johns Hopkins University School of Hygiene and Public Health, Baltimore. He was associated with the Tennessee Department of Public Health until 1934, when he became assistant director of health and safety for the Tennessee Valley Authority. Since 1938 Dr. Crabtree has been in the Commissioned Corps of the U. S. Public Health Service. In June 1940 he became executive assistant to the Surgeon General, U. S. Public Health Service and from March 1941 to April 1943 was assigned to the Office of Defense Health and Welfare Services as executive secretary of the Health and Medical Committee, serving also from July 1942 to April 1943 as medical consultant to the Office of Lend-Lease Administration. He has served as chief medical officer of the Office of Foreign Relief and Rehabilitation Operations since April 1, 1943.

MEETING DEVOTED TO SCRUB TYPHUS

The monthly meeting at Walter Reed General Hospital, Washington, D. C., held January 21, was devoted to scrub typhus. In November 1940 the War Department and Navy Department organized the United States of America Typhus Commission. Some of the members of this commission have recently returned to this country from the Pacific theater. Dr. Francis G. Blake, who was to have read a paper at this meeting, was ill at the Walter Reed General Hospital with malaria, probably contracted while on this mission. Lieut. Col. J. F. Sadusk, also a member of this commission, discussed the clinical features of scrub typhus in Dr. Blake's absence. Dr. Kenneth F. Maxcy, another member of the commission, discussed the epidemiology. Drs. R. E. Dyer and Norman Topping, and Capt. E. G. Hakensson, U.S.N., took part in the discussion that followed the papers. Major Gen. Norman T. Kirk, Surgeon General of the Army, opened the meeting with a brief talk, and Col. Stanhope Bayne-Jones, director of the United States of America Typhus Commission, introduced the speakers.

ORGANIZATION SECTION

OFFICIAL NOTES

MEETING OF THE COMMITTEE ON POSTWAR MEDICAL SERVICE

The Committee on Postwar Medical Service met in Washington, D. C., on Jan. 14, 1944. There were present:

Dr. Roger I. Lee, Chairman

Dr. Arthur W. Allen
Dr. Francis G. Blake
Commander Edward L. Bortz (Navy)
Dr. Fred A. Coller
Captain W. E. Eaton (Navy)
Dr. Morris Fishbein
Dr. Alan Gregg
Dr. Charles M. Griffith (Veterans Bureau)
Dr. W. F. Ossenfort (U. S. P. H. S.)
Dr. W. W. Palmer
Dr. James E. Paullin
Dr. George Morris Piersol
Brigadier General Fred Rankin (Army)
Dr. H. H. Shoulders

After the minutes of the previous meeting were approved, reports from subcommittees were presented, as follows:

The Report of the Subcommittee on Postwar Location and Relocation (Gregg, Piersol and Allen) was presented by Dr. Gregg. "Location" and "relocation" were defined. Physicians in military service who previous to the war had never been in private practice or held a salaried position as a physician will be seeking location: they will be looking either for private practice (general or specialized) or for a salaried position (general or specialized). Physicians in military service who previous to the war were in private practice or in a salaried position as a physician may on discharge be looking for relocation, which means a change of locality or a change of type of practice or both.

The main opinions reported by Dr. Gregg were: The longer the war lasts or the more rapid the demobilization procedure, the greater will be the number of physicians needing assistance in location or relocation. By so much as hospitals can be encouraged to increase the number of their interns, assistant residents and residents and thus create places for returning physicians for a period of adjustment and training, by so much can nearly all aspects of location and relocation be made easier. An obvious opportunity for the American Medical Association exists in providing a clearinghouse of information regarding professional openings, without assuming, however, the responsibilities or services of an employment bureau. Since a wider and more appropriate distribution of hospital and diagnostic facilities would influence decisively a satisfactory location or relocation of physicians in the postwar period, the Subcommittee on Location and Relocation, with Drs. Griffith and Ossenfort as added members, was authorized to explore the subject of hospital and diagnostic facilities and the extension thereof as an effective measure in the better distribution of medical care.

After a general discussion it was voted that the committee recommend to the Board of Trustees of the American Medical Association that the board look into the desirability of establishing an agency for disseminating information on the location or relocation of physicians in the postwar period.

The report of the Subcommittee on Interns, Residents and Special Training (Drs. Palmer, Blake and Coller) was presented by Dr. Palmer. Up to date the work of the committee had been more or less exploratory. The first, and an important, consideration was that many different committees throughout the country are "planning" in this field: individual hospitals, medical schools, county and state societies as well as the American Medical Association and special societies, particularly the national specialty societies, and to these should be added the Council on Medical Education and Hospitals and the Association of American Medical Colleges. The need of coordination—avoidance of duplication and confusion—is great. The best method of coping with the problem seemed to be through the establishing of a close relation with the Council on Medical Education and Hospitals.

The chairman reported that he had written to twelve of his friends at the head of medical clinics in teaching hospitals for information concerning any plans under consideration. All were in agreement that enlarged facilities would be needed to continue the training of men who were unable to finish a reasonably normal period as intern and as resident before entering military service. In general, hospitals should provide for their own men. Should large numbers of men who had their internship in the smaller nonteaching hospitals make a drive on the teaching hospitals, the situation is likely to become hopeless. Probably relatively few men will desire or need more time to complete their internship. Many will have had experience in hospitals which to a large extent will make up for any lack before service. In any event, the number of interns has been reduced in the individual hospitals at the insistence of the Procurement and Assignment Service. The expansion back to the old number can be made by taking on men who return and who wish for more training as interns. It is anticipated that the greatest demand will be in the resident and special training groups. There is general agreement among the physicians thus far canvassed that enlarging the resident staff, making greater use of the outpatient departments, adding extern residents and sharing the opportunities between the recently graduated interns and men returning from service will be about the best that can be offered. Also the use of fellowships to a limited extent will provide the necessary training. Obviously, any such program will require subsidy. One of the large foundations has already made a handsome contribution to the postwar training problem. It is hoped that others will follow the example.

The subject of sending a questionnaire to physicians in the armed forces was discussed, and the committee of Drs. Abell, West and Mason was authorized to proceed with the sending out of a sample, or pilot, questionnaire of 3,000 copies, and it was agreed that a note of this procedure should appear in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The purpose of the pilot questionnaire is to determine the best form of inquiry as to the probable nature of postwar needs of large numbers of physicians now in military and governmental service.

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Departments of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

February 12. "You Must Help Win This War."
Speaker, Harold A. Vouachen, medical director, Caterpillar Tractor Company, Peoria, Ill.
February 19. "Hometown Heroes."
Speaker, James A. Paullin, M.D., President, American Medical Association.
February 26. "Share and Share Alike."
Speaker, Col. Rohland A. Isker, Q. M. C., U. S. Army, Subsistence Research Laboratory, Chicago.

THE CHICAGO SESSION

Seventh Exhibition by American Physicians' Art Association at Hotel Stevens

The American Physicians' Art Association will hold its seventh art exhibition in the gallery of the Hotel Stevens Ball Room June 12 to 16 during the annual session of the American Medical Association. Through the efforts of Mead Johnson and Company the balcony of the immense ballroom of this world

famous hotel has been secured to use as an art gallery with its 500 feet of wall space.

All physicians who do art work, whether beginners or seasoned artists, are invited to participate in this exhibition. There will be over one hundred trophies awarded to four classes of artists from beginners to those who have followed this avocation for over eight years, and any physician who submits an art piece that has merit is quite certain to receive a prize.

The association with the aid of Mead Johnson and Company has arranged so that the submitting of art pieces will entail very little expense. Hanging fees are waived; expressage to and from the show is paid by the association. New members only are required to pay dues of two dollars.

Application blanks, entry blanks and any other information may be obtained from the secretary of the association, F. H. Redewill, M.D., 526 Flood Building, San Francisco.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 2985 has been reported to the House by the Committee on the Judiciary, with the recommendation that it pass. This bill provides for the garnishment, execution or trustee process of wages and salaries of civil officers and employees of the United States.

Bills Introduced.—The President has transmitted to Congress a supplemental estimate of appropriation for the Veterans' Administration for the fiscal year 1944, amounting to $30,000,000 (H. Doc. 391). This amount, it is contemplated, will be used to provide 9,252 additional hospital beds for neuropsychiatric patients. S. 1683, introduced by Senator Thomas, Utah, proposes to codify the laws relating to the Public Health Service. It is a companion bill to H. R. 3379, introduced by Representative Bulwinkle, North Carolina. S. 1690, introduced by Senator Johnson, Colorado, proposes further to amend the Pay Readjustment Act of 1942, and its enactment will permit the counting of service in the Medical Reserve Corps for pay purposes. H. R. 4119, introduced by Representative Lane, Massachusetts, proposes an appropriation of $1,500,000 to construct a veterans' hospital in Lawrence, Mass., to accommodate approximately 2,000 bed patients.

DISTRICT OF COLUMBIA

Changes in Status.—S. 1340 has been reported to the Senate, establishing a sanitary code governing the operation of restaurants in the District of Columbia. S. 1546 has been reported to the Senate, amending the law relating to the incorporation of Providence Hospital. The primary purpose of this bill, according to the committee report, is to permit the hospital to own property in excess of the $150,000 limitation contained in the act of incorporation. It also authorizes the hospital to conduct a school for the education and training of nurses and interns with full power to examine the nurses and interns and to issue suitable certificates evidencing completion of their courses of training. H. R. 2644 has been reported to the House with the recommendation that it pass, granting additional powers to the commissioners of the District of Columbia. Among other things, the commissioners are to be authorized to provide for the waiver of payment by any person in the military service of the United States of any annual or other periodic fee required by the law to be paid to the District of Columbia or to any District of Columbia board or commission as a condition to retaining or renewing any license or permit to engage in any business or calling or to practice any profession in the District of Columbia.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—S. 86, to amend the narcotic drug act, proposes to omit those provisions of the present law which state specifically that the act is not to apply (1) to the sale of a preparation containing not more than ¼ grain of morphine or ⅛ grain of heroin if not more than 1 ounce of such preparation is sold to any one person in any forty-eight consecutive hours, or (2) the sale of ointments or liniments containing narcotic drugs that are susceptible of external use only. H. 147 proposes to authorize the establishment and operation by the state of six tuberculosis sanatoriums. H. 217 proposes that whenever the county judge of a county which has established a county department of health determines that there is an absolute necessity that a physician attend a person who is unable to pay for such services, or whenever an accident occurs and no physician is available in the immediate vicinity, the judge may by written order direct the county health officer to perform such emergency services as are reasonably necessary. H. 223 proposes to require every person infected with a venereal disease immediately on acquiring knowledge of such infection to apply to a public health unit or, if none is available, to a private physician, for treatment for the disease, and to continue to take treatment thereafter until the prescribed course of treatment is completed.

Mississippi

Bills Introduced.—S. 82 and H. 215 propose to establish a state charity hospital and nurses' home in north Mississippi, to be known as the North Mississippi State Charity Hospital and Nurses' Home and to be located in or near the city of Holly Springs, Marshall County. The hospital is to be of sufficient size to care for not less than 60 bed patients and not more than 100 bed patients. S. 84 proposes so to amend the uniform narcotic drug act as to include isonipecaine as a narcotic drug within the meaning of the act and to define isonipecaine as "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified." S. 87 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate that a physical examination was made of the applicant within ten days immediately preceding the date of the application to marry and that the examination did not reveal the presence of any venereal or other contagious disease. S. 91, to amend the privileged communication act, proposes that all communications made to a physician or a surgeon by a patient under his charge or by one seeking professional advice shall be privileged, and that the physician shall not be required to disclose the same in any legal proceeding, except at the instance of the patient or, in case of the death of the patient, by his personal representative, or legal heirs in case there is no personal representative. H. 163 proposes to authorize the establishment and maintenance of state charity hospitals in Jackson in the northeastern part of the state and in the delta section.

New York

Bills Introduced.—S. 371, to amend the laws relating to the practice of medicine, proposes that any licensed physician who enters into military service subsequent to July 1, 1940 and prior to July 1, 1945 within three months after the termination of military service by honorable discharge shall be entitled to a renewal license without examination, reexamination, fine or penalty, notwithstanding the fact that his license or last previous renewal license shall have theretofore expired. S. 409 proposes to provide for a system of compulsory health insurance. A. 505 proposes to enact a separate optical dispensing practice act and to create a state board of examiners in optical dispensing, which is defined as the compounding and dispensing of lenses, spectacles, eye glasses, optical devices or other optical appliances to the intended wearer thereof on the written prescription of a licensed physician or optometrist.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CONNECTICUT

Russell H. Chittenden Prize.—The late Dr. Russell Henry Chittenden, emeritus director of the Sheffield Scientific School of Yale University, New Haven, bequeathed his scientific library to the university and, in addition, a trust fund of $3,000 the income of which is to be used for a prize to be known as the Russell H. Chittenden Prize. The award will be presented at commencement to the member of the graduating class who stands highest in his class at the Sheffield Scientific School.

Personal.—Dr. Frank B. Converse, West Willington, president of the Tolland County Medical Association, was honored at a recent meeting of the association in recognition of his completion of fifty years in the practice of medicine.——Robert C. Challman, Ph.D., was recently appointed provisional director of psychologic laboratories, Norwich State Hospital, Norwich, succeeding Karl Florian Heiser, Ph.D., who has been appointed research director for the state public welfare council.

Compounds Isolated from Tubercle Bacillus Given to Yale.—A permanent collection of 300 chemical compounds isolated from the tubercle bacillus, said to be the only collection in existence, was presented to Yale University by the National Tuberculosis Association on February 3. The collection, which is the result of seventeen years of research by Rudolph J. Anderson, Ph.D., professor of chemistry, Yale University, New Haven, and his associates, was presented by Dr. Lewis J. Moorman, Oklahoma City, president of the tuberculosis association, and was accepted by Charles Seymour, LL.D., president of Yale. Dr. William Charles White, Washington, D. C., chairman of the committee on medical research of the tuberculosis association, spoke on the work of his committee, which initiated the research in 1926 and which has supported the work since that time. He characterizes the collection as "material found nowhere else in the history of man." According to an announcement, the work of Dr. Anderson and his associates has had unusual value, since many of the substances isolated have opened up a whole new field in the knowledge of chemistry, and many of them are to be found only in the tubercle bacillus in minute quantities.

GEORGIA

Associate Dean Named to Emory.—Dr. Robert Morris Paty of the Bibb Manufacturing Company, Porterdale, has been appointed associate dean at Emory University School of Medicine and medical director of Emory University Hospital, Atlanta. A newspaper report stated that Dr. Paty will have responsibility for the supervision of the first two years of medical work offered on the campus, enabling Dr. Russell H. Oppenheimer, dean of the medical school, to devote his time principally to the work of upper classmen at Grady Hospital. Dr. Paty, who graduated at Emory in 1923, was in charge of a hospital at Changchow, China, from 1925 to 1940.

ILLINOIS

Penicillin Available for Ophthalmia in Newborn.—Twenty million units of penicillin has been made available to the Illinois State Department of Public Health by the National Research Council to use on a research basis for the treatment of newborn babies with ophthalmia. Although the silver nitrate law for the protection of babies' eyes has made ophthalmia rare in Illinois, about 30 newborn infants are hospitalized at state expense each year to prevent blindness from a type of ophthalmia that is contracted at birth from mothers infected with a venereal disease, the state health department reported. The 20 million units of penicillin which has been made available to the department is enough to treat 30 infants, it was stated.

Chicago

The Kretschmer Lecture.—Dr. Russell L. Haden, Cleveland Clinic, Cleveland, will deliver the third Edwin R. Kretschmer Memorial Lecture on April 28 at the Palmer House. His subject will be "The Varying Clinical Picture of Leukemia."

Symposium on Antibiotic Agents.—The Chicago Section of the American Chemical Society will conduct a symposium on antibiotic agents at the Medinah Club of Chicago, February 24. Selman A. Waksman, Ph.D., microbiologist, New Jersey State Agricultural Experiment Station, New Brunswick, will discuss "Production and Nature of Antibiotic Substances," and Dr. Wallace E. Herrell of the Mayo Clinic, Rochester, Minn., "Clinical Experience with Antibiotic Agents."

Meeting of Bacteriologists.—The Society of Illinois Bacteriologists held its winter meeting at the Chicago Illini Union, February 11. The speakers at the meeting included Dr. Charles Phillip Miller on "An Institutional Survey of Meningococcus Carriers"; Miss Frances Friewer, Illinois Department of Public Health Laboratories, "The Salmonella Problem in Illinois: The Identification of Types and Their Distribution," and Edward J. Czarnetzky, Ph.D., Research and Technical Department, Wilson and Company, "Bacteriologic Problems of the Meat Packing Industry."

LOUISIANA

Special Society Election.—At the recent meeting of the southern section of the American Federation for Clinical Research in New Orleans Drs. Alfred W. Harris, Dallas, was chosen president; John S. Harter, Jackson, Miss., vice president and Charles T. Ashworth, Dallas, secretary-treasurer. The 1944 section meeting will be held in Dallas.

MASSACHUSETTS

Personal.—Dr. Walter B. Cannon, professor emeritus of physiology, Harvard Medical School, Boston, has been appointed visiting professor of physiology at the New York University College of Medicine.

District Society to Observe One Hundred and Fiftieth Anniversary.—The Worcester District Medical Society plans to observe its one hundred and fiftieth anniversary at a special celebration May 10. According to the *Worcester Medical News* a group of physicians met in Worcester in 1794 to organize the Worcester Medical Society. It states that a medical association had been formed in the county in 1784, of which Dr. Samuel Prentice was secretary. No records apparently are available for this first group. The organization became the district society in 1804.

MICHIGAN

Student Award.—At the recent commencement of Wayne University College of Medicine, Detroit, the Theodore A. McGraw Award, a scholarship given to the outstanding student in the junior class, was presented to Donald E. Preshaw.

Psychiatrists Devote Meetings to War Problems.—Dr. Raymond W. Waggoner, professor of psychiatry, University of Michigan Medical School, Ann Arbor, and psychiatric consultant to the Selective Service System, addressed the Michigan Society of Neurology and Psychiatry, January 20, on "Selection, Rejection, Rehabilitation: Our Psychiatric Responsibilities." The society has been devoting recent meetings to a discussion of war problems, one session having been addressed by Dr. John C. Whitehorn, Henry Phipps professor of psychiatry, Johns Hopkins University School of Medicine, Baltimore, on "Individual Issues in Postmilitary Psychotherapy" and another by Dr. Walter S. Maclay, medical superintendent of the Mill Hill Emergency Hospital, London, "Neurotic Disabilities in a Total War: The Rehabilitation of Neurosis Cases."

MINNESOTA

Foundation Lectures.—Harland G. Wood, Ph.D., Minneapolis, winner of the Eli Lilly and Company Research Award for 1942, gave an exchange lecture at the Mayo Foundation House, Rochester, February 4, on "The Fixation of Carbon Dioxide by Bacteria and Animals."——Lieut. Col. Loyal Davis, M. C., A. U. S., gave a Mayo Foundation Lecture, February 4, on "Recent Experiences with Russian Military Medicine."

Waseca County Accredited for Tuberculosis.—Waseca County was recently accredited for the control of human tuberculosis, receiving its award from the Minnesota Department of Health and the Minnesota State Medical Association during special ceremonies in the public high school in Waseca. Waseca County is the eighth county in the state to receive this award for meeting the requirements for accreditation for the control of human tuberculosis.

MISSISSIPPI

Personal.—Dr. Clyde M. Speck was to resign, January 1, as medical superintendent of the Mississippi State Hospital, Whitfield, to enter private practice. Dr. Luther L. McDougal, Booneville, has been appointed superintendent of the hospital to succeed Dr. Speck.——Dr. William A. Dodson Jr., Gulfport, has been appointed acting director of the Harrison County Health Department.

NEW YORK

Postgraduate Lectures.—The Tompkins County Medical Society will be addressed in Ithaca, February 15, by Dr. L. Maxwell Lockie, Buffalo, on "The Management of Arthritis, Acute and Chronic." On April 18 Dr. Byron D. Bowen, Buffalo, will discuss "The Management of Diabetes with the Newer Forms of Insulin" and May 16 Dr. Abraham H. Aaron, Buffalo, "Evaluation of the Common Drugs Used in General Practice." The Jefferson County Medical Society was addressed in Watertown, February 10, by Dr. Albert F. R. Andresen, Brooklyn, on "Interpretation of Gastrointestinal Symptoms." Dr. Andresen also gave the same lecture before the St. Lawrence County Medical Society in Potsdam on the same day. All the lectures are part of a postgraduate series sponsored by the state medical society and the state department of health.

Medical Societies Advised to Act on "Kickback" Cases.—Herman T. Stichman, Moreland act commissioner, is reported to have issued a warning that the commission may recommend that jurisdictional and disciplinary powers vested in state and county medical societies may be taken from them because of their failure to take "prompt action against physicians charged with giving or receiving 'kickbacks'" in workmen's compensation cases, according to the New York *World-Telegram*, January 24. Mr. Stichman's remarks were addressed to Dr. David J. Kaliski, chairman of the compensation boards of the societies, who was called before the commission when it resumed its investigation into abuses of the workmen's compensation law. According to the *World-Telegram*, Dr. Kaliski protested that the task of deciding cases of doctors charged with abuses of the law would be "too big for any organization if it is suddenly confronted with hundreds of such cases." He added that some cases cited in the inquiry already had been investigated by his boards. He said that medical societies were "as interested in seeing the correction of abuses" as the commission.

New York City

Personal.—Drs. Alan Gregg and Porter J. Crawford of the Rockefeller Foundation recently went to Nassau, Bahamas, to consult with the Duke of Windsor on a plan to build a modern hospital there.——Dr. Francis G. Riley, Jamaica, has resigned as chairman of the board of trustees of the Medical Society of the County of Queens, closing a period of twenty years of consecutive service with the society, in which he has held most of the important offices, including the presidency.

Dr. Kidd Named Professor of Pathology.—Dr. John G. Kidd, associate member of the Rockefeller Institute for Medical Research, has been appointed professor of pathology at Cornell University Medical College and pathologist at the New York Hospital. Dr. Kidd graduated at Johns Hopkins University School of Medicine, Baltimore, in 1932. In 1939 he received the Eli Lilly Research Award in bacteriology and immunology for original work on animal tumors of virus etiology.

Portrait of Dr. Woll.—A portrait of Frederic A. Woll, Ph.D., chairman of the department of hygiene of the College of the City of New York, was unveiled and presented to the college, January 29. Executed by Clayton Braun, the portrait is a gift of Dr. Woll's associates in the department of hygiene. Dr. Woll, who will be retired at the end of the college year in June because of the statutory age limit, first joined the City College in 1907 as a teacher of health and physical education. He has been professor and chairman of the department of hygiene since 1927.

Symposium on the Heart.—The New York Heart Association, a division of the New York Tuberculosis and Health Association, was addressed February 1, among others, at the New York Academy of Medicine by Drs. Ward J. MacNeal and Charles A. Poindexter on "Arrest of Endocarditis by Penicillin"; Col. John T. King, M. C., A. U. S., "Heart Disorders in an Army General Hospital," and Dr. Robert L. Levy, "The Diagnosis of Cardiovascular Diseases in Registrants for Military Service: Observations Based on the Reexamination of 5,000 Rejectees."

Meeting on Diabetes.—The New York Diabetes Association will be addressed at a meeting in the New York Academy of Medicine, February 19, by Drs. Joseph H. Barach, Pittsburgh, and Joseph T. Beardwood Jr., Philadelphia, on "Normal Standards in the Treatment of Young Diabetics" and "Report on the Philadelphia Diabetes Survey" respectively. The meeting will conclude with a round table discussion on diabetes, participating speakers to include Drs. Cecil Striker, Cincinnati; Seale Harris, Birmingham, Ala.; J. West Mitchell, Pittsburgh; Elliott P. Joslin and Howard F. Root, Boston, and Edward S. Dillon, Philadelphia.

Illegal Practitioner Sentenced.—The state education department reports that Bertha Hess (or Hesse) was sentenced, Dec. 21, 1943, in the court of special sessions of the City of New York, Bronx County, to pay a fine of $100 or serve thirty days in the workhouse and, in addition, to serve three months in the workhouse, the workhouse sentence being suspended during good behavior. The woman was arrested on Nov. 22, 1943 in New York on a charge of unlawfully practicing medicine. It is reported that she had been "treating her patients by massage, baths, diet and teas for conditions which included arthritis, acne, pains in the back, and in the case of eye conditions she applied wet pads soaked in tea to the eyes as well as prescribing diet, teas and giving massage. Her usual examination consisted of taking the pulse and examining the eyes with a magnifying glass, although in some cases she also pressed upon the spine or the region complained of with her fingers."

Promotions Among Health Personnel.—The New York City Department of Health announces the following promotions among health officer personnel to the health and teaching centers of the department: Dr. Michael Antell, former health officer of the Richmond Health Center and Borough Office, to the Washington Heights Health and Teaching Center; Dr. Eugene O. Chimene, Jackson Heights, N. Y., former health officer of the Flushing-Corona Health District, Queens, to the East Harlem Health and Teaching Center; Dr. Harold H. Mitchell, Long Island, N. Y., former health officer of the Astoria-Long Island City Health District, to the Lower East Side Health and Teaching Center; Dr. Jerome S. Peterson, former health officer of the Central Harlem District, to the Red Hook Health and Teaching Center, Brooklyn. Dr. Herbert R. Edwards, director of the department's bureau of tuberculosis, will continue to devote part of his time as health officer of the Kips Bay-Yorkville Health and Teaching Center.

OKLAHOMA

Personal.—Dr. Albert W. Roth, Tulsa, was recently elected an honorary member of the Tulsa County Medical Society. ——Dr. Finis W. Ewing, Muskogee, has been appointed a member of the state board of medical examiners to succeed the late Dr. Calvin E. Bradley, Tulsa.

Changes in Licensure.—The Oklahoma State Board of Medical Examiners at a meeting, December 28-29, took the following actions:

Dr. Gappa M. Rushing, Durant, license revoked.
Dr. Estey Elwood Lawson, Medford, license suspended.
Dr. William Thomas Nunn, Roff, placed on probation for one year.
Dr. Henry John Nelson, Pasadena, Texas, formerly of Mangum, license reinstated, but narcotic dispensing privileges denied to him.
Dr. Clarence Andrew Griffin, Idabel, license reinstated, but narcotic dispensing privileges denied to him.
Dr. Paul William Gutsche, Hazard, license restored.

PENNSYLVANIA

Personal.—Dr. Henry F. Adams, North East, has been named medical director of Erie County.——Dr. Daniel M. Replogle, Altoona, has been appointed coroner of Blair County.

Philadelphia

Course in Public Health Administration.—The department of public health and preventive medicine of the University of Pennsylvania School of Medicine will open a course on public health administration, February 15, for persons who wish to become more familiar with administrative practices in this field and especially for graduates in medicine who are working or desire to work for the master of public health degree. The course will continue until June 15.

Creation of Mental Health Division Recommended.—At a meeting of the board of directors of the Philadelphia County Medical Society, January 12, a recommendation of the committee on nervous diseases and mental hygiene, urging the establishment of a division of mental health in the Philadelphia Department of Public Health, was approved. The recommendation, as adopted by the society, carries the endorsement of the society and suggests that psychiatric consultants be utilized at teachers' institutes and similar meetings to acquaint educational authorities with the problem of mental illness, that courses in mental hygiene be incorporated into the curriculum of schools, the courses to be taught by psychiatrists rather than by teachers superficially acquainted with psychiatric principles, and that psychiatrists be included among the medical examiners of the present school medical system so that they may act in an advisory capacity in behavior and disciplinary problems which may indicate the onset of mental illness. The recommendations further urged that the men of the community rejected at induction centers because of psychoneuroses and other nervous and mental conditions should be directed to adequate rehabilitative

treatment to assist the average general practitioner in recognizing minor mental illnesses. The committee recommends the arrangement of a course in the practical management of the psychoneuroses to be given to those members of the society who may be interested.

Retirements at Temple University.—Dr. Wilbur Emory Burnett, formerly professor of clinical surgery at Temple University School of Medicine, has been appointed professor of surgery to succeed Dr. William Wayne Babcock. Dr. Babcock, who is one of a group to be retired for age, will become professor emeritus. Other new appointees named to succeed physicians in the retired group include:

Dr. Thomas Harold Davis to succeed Dr. Robert F. Ridpath, professor of laryngology and rhinology.
Dr. John Franklin Huber to succeed Dr. John B. Roxby, professor of anatomy.
Dr. Robert H. Hamilton Jr. to succeed Dr. Melvin A. Saylor, professor of physiologic chemistry.
Dr. Morton J. Oppenheimer to succeed Dr. Joseph G. Hickey, professor of physiology.
Dr. Lowrain E. McCrea to succeed Dr. William Hershey Thomas, professor of urology.

Other physicians who are being retired are Drs. Harriet L. Hartley, professor of preventive medicine, hygiene and public health, Harry A. Duncan, clinical professor of gynecology, Howard G. Fretz, clinical professor of urology, Daniel J. Donnelly, assistant professor of medicine, Henry C. Groff, associate professor of medicine, and Joseph Wesley Anders, associate in laryngology and rhinology. New appointments to the faculty include those of Dr. Esther M. Greisheimer, professor of physiology, Woman's Medical College of Pennsylvania, to professor of physiology, Donald L. Kimmel, Ph.D., assistant professor of anatomy, Baylor University College of Medicine, Houston, to associate professor of anatomy, and Clement A. Fox, Ph.D., associate in neurology, Northwestern University School of Medicine, to associate professor of anatomy.

UTAH

Industrial Health Symposium.—The industrial health committee of the Utah State Medical Association sponsored a symposium at the Newhouse Hotel, Salt Lake City, January 19. The speakers were:

O. A. Wiesley, Salt Lake City, Workmen's Compensation.
Dr. John L. Jones, Salt Lake City, State Industrial Hygiene Service.
Dr. Paul S. Richards, Bingham Canyon, The Industrial Clinic.
Dr. Maxwell M. Wintrobe, Baltimore, Nutrition in Industry Under Rationing.
Major William B. Fulton, M. R. C., Preventive Medicine in Industry.
Major John E. L. Keyes, M. C., A. U. S., Ophthalmology in Industry.
Dr. Leroy U. Gardner, Saranac Lake, N. Y., Diseases of the Chest in Industry.
Dr. George W. Wright, Trudeau, N. Y., Disabilities in Silicosis.
Lieut. Col. Samuel G. Peck, M. R. C., Industrial Dermatosis.

WASHINGTON

Personal.—Dr. Asahel J. Hockett, New Orleans, has been appointed superintendent of the King County Hospital, Seattle. He has been serving as superintendent and medical administrator of the Touro Infirmary, New Orleans.

Society News.—Dr. Joel W. Baker, Seattle, presented "A Review of General Surgery with Particular Reference to Differential Diagnosis at the Operating Table and Choice of Surgical Procedures" before the Walla Walla Valley Medical Society recently. Others on the program were Lieut. Col. John D. Lamon Jr. and Capt. Gerhard Danelius, M. R. C.

Honorary Members Named.—The Washington State Medical Association has announced that honorary memberships have been granted to Drs. Earl M. Carney, Jay T. Dowling, Albert B. Kidd, Charles E. McClure, Donald A. Nicholson, Herbert C. Ostrom, Richard W. Perry, Lorenzo L. Stephens and Philip V. Von Phul, all of Seattle; Charles L. Dixon, Renton; Warner M. Karshner, Puyallup; Thomas B. Curran, Charles R. McCreery and William B. McCreery, all of Tacoma, and Emil M. Welty and William E. Abrams, both of Spokane. The McCreery physicians are twins. They were born on Nov. 14, 1874, were graduated at the University of Minnesota Medical School, Minneapolis, in 1902 and licensed to practice in Washington in 1903. In 1906 they were elected to membership in the Pierce County Medical Society and the state medical association.

WISCONSIN

Building Named for Dr. Caples.—The former Waukesha Springs Sanitarium will henceforth be known as Caples Hall in accordance with action taken by the board of trustees of Carroll College, Waukesha, to honor Dr. Byron M. Caples, who established the sanatorium in 1898 and who operated it until its recent sale to Carroll College (THE JOURNAL, Aug. 28, 1943, p. 1261).

GENERAL

Special Society Election.—A recent mail ballot of the American Roentgen Ray Society resulted in the election of the following officers: Drs. Lyell C. Kinney, San Diego, Calif., president-elect; Paul C. Hodges, Chicago, and Major Aubrey O. Hampton, M. C., A. U. S., vice presidents; H. Dabney Kerr, Iowa City, secretary; James Bennett Edwards, Leonia, N. J., treasurer, and Dr. Ramsay Spillman, New York, historian. Dr. Sherwood Moore, St. Louis, will be president for the coming year.

Warning on Mineral Water to Relieve Rheumatism.—A report has been received that orders are being taken by the Rutherford Laboratories, Post Office Box 143, Westwood, N. J., for "Canada Mineral Water," which, it is said, is being sold to relieve rheumatism. One check for $5 was cashed by "Dr. Henzling." Inquiries directed to the laboratories are said to bring no response. The Bureau of Investigation of the American Medical Association does not have a record of the Rutherford Laboratories or of "Canada Mineral Water." Neither is it able to identify the "Dr. Henzling" reputed to be connected with the firm.

Physician's Documents Missing.—Dr. Carl S. J. Tillmanns, Los Angeles, announced that the following documents have disappeared from his office:

Diploma, Washington University School of Medicine, St. Louis, issued in 1907; the document now missing is a duplicate.
California license C 1440 of 1919, also a duplicate.
Illinois State license of 1907.
Missouri State license of 1907.
Iowa State license of 1908.
North Dakota State license of 1914.

Dr. Tillmanns announces that in 1934 his name was changed from Charles to Carl, and the California book of licenses records it as "Carl or Charles."

Grants for Research on Sex and Reproduction.—Applications to the committee for research in problems of sex, National Research Council, for financial aid during the fiscal year beginning July 1, in support of work on fundamental problems of sex and reproduction, should be received before April 1. They may be addressed to the chairman, Robert M. Yerkes, Ph.D., Yale University School of Medicine, New Haven 11, Conn. Although endocrine investigations continue to command the interest and support of the committee, preference, in accordance with current policy, will ordinarily be given to proposals for the investigation of neurologic, psychobiologic and behavioral problems of sex and reproduction.

Dentists Hold War Session.—The war service committee of the American Dental Association will meet at the Palmer House, Chicago, February 19, with Capt. C. Raymond Wells (DC), U. S. Naval Reserve, president of the American Dental Association, presenting the opening address. Other speakers will include:

Edward C. Elliott, LL.D., president, Purdue University, Lafayette, Ind., The Present Status of the Army and Navy Specialized Training Program, and Probable Effect on Future Dental Service to the Civilian Population Under Present War Manpower and Selective Service Regulations and Policies.
Warren F. Draper, acting surgeon general, U. S. P. H. S., Civilian Health in World War I and Now.

The meeting will also include symposiums on "Service Rendered by the American Dental Association in This Crisis to the Armed Forces and Civilian Practice" and "Dental Instruments, Equipment and Supplies."

American Orthopsychiatric Association.—The twenty-first annual meeting of the American Orthopsychiatric Association will be held at the Palmer House, Chicago, February 17-19. Discussions will be devoted to the origin of group prejudices, mental health in the military services, group therapy, experimentation on movement frustration and aggression, clinical studies, prophylaxis and rehabilitation in wartime, preventive aspects of orthopsychiatry and problems of therapy and management. Among the speakers will be Drs. Henry C. Schumacher, Cleveland; Leonard Rosenzweig, North Warren, Pa.; Lawson G. Lowrey, New York; David M. Levy, New York; Karl A. Menninger, Topeka, Kan.; George S. Stevenson, New York; Thomas A. C. Rennie, New York; George H. Preston, Baltimore; Edith B. Jackson, New Haven, Conn.; Hyman S. Lippman, St. Paul, and S. Spafford Ackerly, Louisville, Ky.

CANADA

New Professor of Clinical Medicine.—Dr. George K. Wharton, London, Ont., has been appointed professor of clinical medicine at Queen's University Faculty of Medicine at Kingston. Dr. Wharton was a fellow in medicine at the Mayo Foundation, Rochester, Minn., from January 1929 to January 1932. He received the degree of M.S. in medicine from the University of Minnesota in 1931.

Physical Therapy School Opened at McGill.—A school for training physical therapy technicians has been opened at McGill University under the Faculty of Medicine, Montreal. Dr. Guy H. Fisk, medical director of the school of physical therapy, is director of the course and Miss M. Finley chief instructress. The entrance requirements are senior matriculation or its equivalent, and the course is of two years' duration with an additional six months' hospital work. A university diploma will be granted at the completion of the course. Graduates are eligible for membership in the Canadian Physiotherapy Association.

LATIN AMERICA

Health Activities in Latin America.—The national government of Brazil and the Institute of Inter-American Affairs have agreed to cooperate in a health and sanitation program over a period of five years, beginning January 1. The national government will contribute 5 million dollars and the institute 3 million dollars to finance the program. The new agreement assures the continuation of health and sanitation work in the Amazon and Rio Doce valleys of Brazil, which are being developed as sources of strategic materials. The funds will enable the organization, built up in the last two years for the Amazon and Rio Doce work, to carry on numerous projects for malaria control, building of hospitals, health centers and dispensaries and the training of nurses and other personnel. In Mexico a similar agreement was set up between the institute and the national government, the 5 million dollar cost to be shared by the government and the institute.

Extend Facilities for School of Public Health.—In December arrangements were completed by the Inter-American Cooperative Health Service to expand the present facilities of the school of public health in Mexico by financing the purchase of equipment and supplies and by supplementing salaries in order to build up a full time faculty. The plan will assist in developing a course in public health and preventive medicine in accordance with principles approved by the committee on hygiene of the League of Nations, by the American Public Health Association and by the Office of the Pan American Sanitary Bureau. No tuition will be charged to physicians studying at the school under the auspices of the Institute of Inter-American Affairs or of any of the service of the various countries in which cooperative programs of health are in operation. The course will run forty weeks, ending November 18, and will be divided into four trimesters, allowing ten weeks each for introductory subjects, basic subjects, special courses and practical field training. Tentatively it has been decided to limit the enrolment to fifty students, twenty to twenty-five from Mexico and twenty-five to thirty from other Central and South American countries.

Leprosy Survey.—A survey just completed by federal health authorities indicates that Mexico probably has a leprous population of about 21,000. The study, conducted over a nine year period, is part of a national drive against the disease and revealed 7,000 cases under control of the National Prophylactic Service Against Leprosy and, in addition, 10,929 patients who are either suspected of being contaminated or who are regarded as potential victims. The report states that, since the disease takes a heavy toll in rural regions, the actual incidence is thought to be several times the number of cases reported. The largest concentration of the leprous was uncovered in the states of Guanajuato, Jalisco, Michoacan, Sinaloa, and the Federal District. The most vulnerable group are men between 30 and 39. Few children were found infected and not a single person with leprosy was discovered under the age of 5.

Malaria Control.—In the Dominican Republic a malaria control project was to be launched at San Cristobal during December. In Panama two malaria control drainage jobs were completed in Capira during September.

New Construction.—The Institute of Tropical Medicine at Belem, Brazil, was completed during August, and fifty beds are available. Hospitals are under construction under the Amazon project at Santarem and Rio Branco, Brazil. A new laboratory at Vitoria, Brazil, has been established to provide facilities and information for all field services. In Barranquilla, Colombia, an addition to the children's hospital has been started. A camp school for underprivileged children is nearing completion near Manizales, capital of Caladas, Colombia. In Haiti a health center was completed at Port-au-Prince, similar in design to rural health centers in southwestern cities of the United States.

Latin Americans Acknowledge Cooperation.—A feature of the observance of Independence Day of the Brazilian medical associations was the presentation of a testimonial parchment to President Roosevelt through American Ambassador Caffrey, acknowledging the services rendered by physicians of the United States. The parchment serves as an expression of the feeling of solidarity by physicians in Brazil to their colleagues in the United States. The testimonial is signed by the presidents of the following groups: National Academy of Medicine, Brazilian Academy of Military Medicine, Brazilian College of Surgeons, Medical Syndicate of Rio de Janeiro, Society of Ex-Interns of Military Hospitals, Brazilian Society of Dermatology and Syphilology, Brazilian Society of Gastroenterology and Nutrition, Brazilian Society of Gynecology and Obstetrics, Brazilian Society of Ophthalmology, Brazilian Society of Pediatrics, Brazilian Society of Tuberculosis and the Brazilian Society of Urology.

Society News.—Dr. Percival Bailey, of the Illinois Neuropsychiatric Institute, Chicago, gave a series of lectures in Mexico City in January on "Cerebral Tumors in the Child" and "Surgical Indications in Cerebral Tumors." Dr. Bailey was in Mexico at the invitation of Dr. Gustavo Baz, secretary of the federal department of health and public welfare.

FOREIGN

New Group of Otolaryngologists.—The British Association of Otolaryngologists recently formed with Dr. William M. Mollison, London, as president. Other officers are Lionel Colledge, vice president, Victor E. Negus, honorary treasurer and Frank C. Ormerod, honorary secretary, all of London. The temporary address of the association is 22 Upper Wimpole Street, London W. 1.

Child Health Project in China.—The China Aid Council and the American Bureau for Medical Aid to China are cooperating in a child health project to be set up shortly in China. The council has made a grant of $10,000 for a child health institute and has assisted in making possible a course of training in child guidance which Dr. Chich Sung and his wife, Dr. Tsui-mei Huang Sung, are taking preparatory to returning to China. They will be sent to China by the American Bureau for Medical Aid to China to participate in work of the national health administration as well as in the proposed health institute.

State Medicine Waning in New Zealand.—A planning committee has been set up in New Zealand to study the problems arising from the program of free national medical service which has now been in existence two years (THE JOURNAL, Nov. 22, 1941, p. 1800), newspapers report. The two year old free national medical service in New Zealand is not proving successful, newspaper reports indicated on January 24. War mobilization has left New Zealand short of doctors. In one region in the capital there are 40,000 people without a single practicing physician, it was stated. In numbers of rural areas the only physician has been mobilized and replacement has been difficult. In 2 instances organized workers have declined to continue with their jobs unless physicians are provided, the report continued. According to press reports "Dr. W. Newlands, a former member of the national medical council, recently charged that 'some medical men who cannot be called eminent received $50,000 each from the social security fund last year.' This figure was said by a government official to be too high, but country doctors generally consider their city colleagues are pulling down handsome incomes for reduced service. Physicians back in New Zealand after years of service with the armed forces have been startled," it was stated. One past president of the medical association is said to have described the situation as "an awful racket." "Since the national health service became free, doctors have been so heavily dated up in their consulting rooms there have been instances of them refusing to visit cases which have proven fatal. Cases cited by Dr. Newlands include three physicians who, he said, were making incomes equivalent to 73 attendances on patients on every day of the year. If a doctor worked ten hours a day, he said, this meant he still had to see seven people an hour exclusive of his traveling time. This situation of overconsultation and markedly higher earnings for diminished service is generally admitted by medical men. It was one of the developments anticipated by the National Medical Association when the free doctor plan was proposed. It has apparently weighed with Prime Minister John Curtin's Australian nonparty committee on medical care which recently reported to the Australian house of representatives that such systems as that in operation in New Zealand 'offered no solution to the problem and were subject to abuses which were very difficult to check.'" Newspaper reports indicated that the physicians feel that a reasonable scheme can be operated only if political control is avoided and that professional control of the whole field will enable them to check existing abuses which they deplore. The report states that the administration has not yet shown its hand on the question of racketeering in medical fees, reduced standards of care and excessive certification, but it is believed that there have been a number of cases where payment has been refused physicians who have been felt to be giving inferior service.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 8, 1944.

Drug Control Required as Soon as European Countries Are Free from Axis Control

The two international bodies created under the Dangerous Drugs and Opium Conventions—the Permanent Central Opium Board and the Supervisory Body—have recently concluded meetings in London. The Central Board lays the greatest emphasis on the importance of instituting at the earliest possible moment a complete control, along the lines laid down by the international conventions, over the manufacture and distribution of narcotic drugs in the enemy and enemy occupied countries of Europe as they come under the military or civil control of the United Nations. Unless this is done there is a grave danger of a recrudescence of the illicit traffic in drugs and the spread of drug addiction such as occurred after the war of 1914-1918. Large supplies of the drugs will be required by medical relief organizations in the devastated countries, and their control and distribution will be a matter of the first importance. In the case of countries which have been occupied by the Axis powers, the restoration to full efficiency of the national administrations may take a considerable time. The board suggests that arrangements should be completed without delay with the military authorities who will be in control.

Bill for the Rehabilitation of the Disabled

A disabled persons employment bill, introduced by the government, has received a warm welcome in the House of Commons. For the first time, rehabilitation and resettlement are treated as a single problem, combining medical science and industrial knowledge. The hope inspired in the patient when economic independence by means of his own efforts is offered to him is considered a valuable aid to his recovery. Recently, when prisoners were repatriated from Germany because they were disabled, the Ministry of Labor instructed all its local officers to get in touch with those in their areas with a view to assisting them. Physical therapy and occupational therapy have been introduced into many hospitals with amazing results. The limb fitting specialists working under the auspices of the Ministry of Pensions at centers established for this purpose have achieved remarkable results.

Pulmonary tuberculosis causes a large number of disabilities. The experience of the pioneer village settlement for the tuberculous at Papworth, where the patients work under medical control, has shown how much can be achieved in these cases. For many years the only occupations for the blind were brush making and basket making. Now they follow many occupations, and the war has made new openings for them.

The new bill is based on the principle that disability is a handicap, not a barrier, to employment. Wartime experience has shown that all but a small minority of the disabled can find work. But the government has come to the conclusion that voluntary effort is not enough and that a legal obligation is necessary. As peace has its casualties as well as war, the bill will cover the entire population and is a permanent addition to the country's social services. A register of disabled persons will be set up. The bill imposes an obligation on employers to employ a specific quota of persons registered as disabled. The scheme will include facilities for vocational training. Industry can and should provide much of its own training, but the task will not be left to chance. The bill was welcomed particularly by the labor party. It was thought that men disabled in the war should have priority over civilian casualties.

BRAZIL

(From Our Regular Correspondent)

Jan. 6, 1944.

Variation in Selection of the Primary Causes of Death

It is important medically to ascertain the exact degree of comparability of the statistics of causes of death as registered by the vital statistics bureaus of different countries. Regarding this problem Dr. Lincoln de Freitas of the National Department of Health has recently published a paper on the selection of the primary causes of death in Brazil in which he completes a contribution from Dr. T. A. Janssen of the United States Census Bureau which appeared in 1938 as a special report (Census Bureau, Special Reports on Vital Statistics, Vol. 5, No. 47). In his paper Dr. Janssen studied the degree of agreement in the selection of the primary causes of 1,032 deaths forming a specially organized sample, as classified by the statistical bureaus of eighteen countries (Australia, Belgium, Canada, Ceylon, Denmark, England and Wales, Italy, the Netherlands, New Zealand, Norway, the Philippines, Scotland, South African Union, Spain, Sweden, Switzerland, Turkey and the United States). The fact that Brazil had not been included in Dr. Janssen's study makes the contribution of Dr. de Freitas especially interesting. Translated into Portuguese, the list of 1,032 deaths has been submitted by Dr. de Freitas to the Bureau of Demographic Statistics of the Ministry of the Interior, which is in charge of classifying the deaths registered in the twenty states of Brazil as a whole. The paper here summarized studies with full particulars the degree of agreement between the classification of those deaths by the Brazilian bureau and their classification by the bureaus of the eighteen countries included in Dr. Janssen's study. Not all the countries could classify the 1,032 deaths: England and Wales classified only 874, Belgium 963, the South African Union 978, Spain 1,024, Sweden 1,010, Turkey 1,029 and Switzerland 1,031. All the other countries, including the United States and now Brazil, classified the full 1,032 deaths. In his analysis of the results of the classification by the eighteen countries Dr. Janssen pointed out, as an evidence of great diversity in the principles guiding the selection of the primary cause of death, that in all the groups of causes constituting the several chapters of the International List of Causes of Death the maximum percentage in each group is practically twice as great as the minimum.

Comparison of these percentages with those obtained by the Brazilian classification shows a general agreement; the percentages of the Brazilian classification lie as a rule between the maximum and the minimum, being generally near the average percentages. Significant exceptions are found only in the percentages of deaths from diseases of the nervous system, slightly higher than the observed maximum registered for the eighteen countries, and from diseases of the digestive system, slightly lower than the minimum. The percentage of agreement between the classification of deaths from all causes by the Brazilian bureau and the average of the bureaus of the other eighteen countries was 56.6, the minimum percentage of agreement being 46.7 in the case of Belgium, and the maximum being 65.9 in the case of Italy. The percentage of agreement between the classification by the Brazilian bureau and by that of the United States was 55.1. The agreement between the classification by the Brazilian bureau and the classification by each one of the eighteen countries for deaths from various causes varied rather widely, from the minimum of 13.6 per cent agreement for alcoholism to the maximum percentage of 88.0 for influenza. For the eighteen countries as a whole the minimum percentage of agreement was 43.6 (for the deaths caused by syphilis), and the maximum was 73.6 (for the deaths caused by cancer and other malignant tumors). The lower third of the average percentage of agreement (between 43.6 and 52.1) occurred in the

case of deaths caused by syphilis, anemias, diseases of the mouth and pharynx, circulatory disorders of the brain, diseases of the prostate, alcoholism and meningitis. The median third of the average percentage of agreement (between 53.3 and 56.4) occurred in the case of deaths caused by nephritis, diseases of pregnancy, childbirth and the puerperal state, appendicitis, diseases of the heart, arteriosclerosis, pneumonia, peritonitis, cirrhosis of the liver and diseases of the thyroids and parathyroids. Finally, the upper third of the average percentage of agreement (between 59.1 and 73.6) occurred in the case of deaths caused by diseases of the first year of life, hernia and intestinal obstruction, tuberculosis, peptic ulcers, diabetes, influenza and cancer. Dr. de Freitas studied in particular the degree of agreement of classifications in some important causes of death. This part of his study was summarized by presentation of the average percentage of agreement between the classification by the Brazilian bureau and by that of the eighteen countries as a whole, and also the percentage of agreement with the classification by the United States Census Bureau.

BUENOS AIRES

(From Our Regular Correspondent)

Jan. 1, 1944.

Medical Lectures

Dr. Carlos Jiménez Díaz, head of the clinical ward of the Faculty of Medicine of Madrid, recently gave four lectures at the Faculty of Medicine of Buenos Aires. In the first lecture, "Nosologic Place of Allergy in Relation to Asthma," he concluded that allergy is a constitutional reaction due to an active, abnormal response of the cells to certain influences. Sensitization of the antigen-antibody type is a special reaction in the development of which climatic, infectious and nervous factors (conditioned reflexes) also are concerned. Dietary allergens, as single factors, produce true sensitization only in rare cases. The latter fact explains the frequent failure of desensitization and deallergization if the general active cellular reaction is not properly controlled. Control of the cellular reaction in the future will put an end to the pessimistic saying that "the one who was born with asthma will die with it," Dr. Jiménez Díaz believes.

Although the diagnosis of typical bronchial asthma offers no difficulty, in view of the numerous clinical varieties of this disease, diagnosis is often not so simple. In the second lecture the speaker also discussed the history of the knowledge of asthma and the relations between asthma, bronchitis, emphysema and pulmonary sclerosis as determined by clinical x-ray and spirometric examinations. The speaker found by studies and clinical experience that the crisis in asthma is caused mainly by changes of the pulmonary circulation in association with interstitial edema, local edema of the mucosa and increased local secretion. Bronchial spasm, expiratory bronchial collapse and the fixed posture of the diaphragm are secondary factors.

In "Asthma of Infectious Origin" Dr. Jiménez Díaz spoke also of the forms and character of nonallergic asthma, especially infectious asthma. This is either primary and acute or secondary to various other diseases, especially chronic diseases of the respiratory tract, pneumonia and neuritis. Desensitization is of no value. The disease may regress or follow either a chronic or an acute course. Severe asthma may develop to progressive collapse or to cyanotic cachexia. Allergic eosinophilic infiltrations and atelactasis of asthmatic pseudopneumonia assume an important role in the development of infectious asthma. Nasal polyps, certain changes of the nasal fossae and diseases of the sinuses are of secondary importance in the development of the disease, in which a constitutional reaction is the main factor. Bacteria produce an allergic reaction of a humoral type which progresses as a hyperergic inflammation.

In a final lecture Dr. Jiménez Díaz discussed clinical and experimental nutritional protein edema. The speaker analyzed the clinical symptoms and physiopathologic mechanism in the production of edema, in which the diminution of proteins in the blood and qualitative changes of the ratio globulin/albumin in the blood are the main factors. Thinness, low organic resistance and similar conditions are important contributing elements. The speaker also discussed the changes in nutritional edema brought about by forced renutrition and by transfusion of plasma. According to his experimental observations, hypoproteinemia in nutritional edema is not a direct result of a low protein diet, depending primarily on a low calory diet, with consequent increased destruction of proteins. Acute deficiency of proteins in certain organs results in an acute diminution in the production of enzymes by those organs.

Experimental Traumatic Shock

In a recent lecture before the Sociedad Argentina de Biologia, with Dr. B. A. Houssay presiding, Dr. V. H. Cicardo said that experiments carried on in the Centro de Investigaciones Tisiologicas of Buenos Aires showed that the arterial pressure of dogs falls immediately after removal of a tourniquet from the leg of an animal previously traumatized or in a condition of ischemia. The shock can be produced in animals which did not have hemorrhages and in which the size of the leg is not increased. The nervous system was found to be secondary in the production of shock, which occurred in the same degree in animals with reflex excitability and in those completely curarized. The passage of a toxic substance from the traumatized or ischemic leg into the blood was verified by the results of crossed circulation. Shock occurred in the recipient dog but not in the traumatized animal. Study of the electrolytes in the blood plasma of the femoral vein and of blood in general circulation showed a constant increase of potassium in the former and a moderate increase in the latter. The amount of potassium in the blood plasma was diminished in comparison to that in the femoral vein because of the fixation of the substance in the tissues and its greater dilution in the former than in the latter. The amount of sodium in local and general plasma was equal. The amount of chlorides in the plasma of the femoral vein was diminished in comparison to that in the blood. Lowered blood pressure and depressed cardiac function exhibited the classic effect of traumatic hyperpotassemia, which was increased by the production of potassium by certain tissues caused by local anoxemia from hypotension, producing shock. When the latter was not acute, the condition of the animal was improved by the administration of calcium.

Psychopathology According to Thomas Aquinas

Dr. E. Eduardo Krapf, Buenos Aires psychiatrist, recently published a book in which he compares the medieval psychiatric and psychopathologic concepts according to Thomas Aquinas (1225-1274) and the modern concepts. Krapf analyzes Thomas Aquinas's book (which is the only source of medieval psychiatry) and draws an interesting parallel between the medieval and modern psychiatric conceptions.

Marriages

Norris M. Burleson, Port Allegany, Pa., to Miss Catherine McMillan of Vass, N. C., January 6.

Ernest Joseph Eytinge, Redlands, Calif., to Miss Marion Parker Hedges of Brooklyn, January 17.

John Fielding Crigler Jr., Charlotte, N. C., to Miss Mary Adele Sippel of Baltimore, January 8.

Hilbert P. Jubelt, Gillespie, Ill., to Miss June Lucile Mathews of Urbana, December 27.

Orin Watts Booth to Miss Elizabeth Amanda Mack, both of Durham, N. C., December 18.

Harry A. Davis Jr., Sumter, S. C., to Miss Alfreda Lytle of Tyrone, Pa., December 31.

Deaths

William George MacCallum ⊕ formerly Baxley professor of pathology and director of the department of pathology and bacteriology, Johns Hopkins University School of Medicine, died February 3, aged 69.

Dr. MacCallum, son of a physician, was born in Dunnville, Ontario, April 18, 1874. He graduated at the University of Toronto in 1894 and at Johns Hopkins University School of Medicine in 1897. After an internship at Johns Hopkins Hospital he served as resident pathologist; at the time of his death he was pathologist-in-chief. He joined the teaching faculty at Johns Hopkins in 1899 as assistant in pathology, later serving as associate professor and professor of pathologic physiology and lecturer in forensic medicine. In 1909 Dr. MacCallum went to Columbia University College of Physicians and Surgeons as professor of pathology, serving also as pathologist at the German Hospital and at the Presbyterian Hospital. In 1917 he returned to Johns Hopkins to become professor of pathology and bacteriology, filling the position held by the late Dr. William H. Welch. He served as head of the department until last spring, when he retired. At the time of his death he was a member of the advisory board of the faculty of medicine and a member of various committees at the school.

Dr. MacCallum was a member of the National Academy of Sciences, American Association for the Advancement of Science, Association of American Physicians, the Medical and Chirurgical Faculty of Maryland, the American Medical Association and the Harvey Society, of which he was president in 1914. He was a fellow of the New York Academy of Medicine and an honorary fellow of the Royal Society of Medicine. In 1909 he was president of the International Association of Medical Museums.

Dr. MacCallum had contributed much to the scientific side of medicine. As early as 1897 with Opie he demonstrated the sexual conjugation of parasites of avian malaria. He was one of the first to show that the presumable source of pancreatic glycosuria is in the islands of Langerhans. Valuable observations were noted in his later research on rheumatism, filtrable viruses, cirrhosis of the liver and the pathology of pneumonia following influenza. His work with Voegtlin on the parathyroids was notable. Dr. MacCallum's numerous contributions to medical literature reflected the wide range of his research. His "Textbook on Pathology," first published in 1916, is of value to the teacher and student. He also wrote a "Biography of W. S. Halsted."

James Grassick, Grand Forks, N. D.; Rush Medical College, Chicago, 1885; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; also a pharmacist; member of the House of Delegates of the American Medical Association in 1913; formerly a director of the National Tuberculosis Association; historian, member and in 1924 president of the North Dakota State Medical Association; a founder, charter member, first president and later president emeritus, North Dakota Anti-Tuberculosis Association; Camp Grassick, resort for undernourished children on Lake Isabel near Dawson, was named for him; superintendent, state board of health from 1907 to 1912; for many years university physician at the University of North Dakota and special lecturer at the school of medicine; served on the staffs of the North Dakota Deaconess and St. Michael's hospitals; author of "North Dakota Medicine —Sketches and Abstracts," the "Paisley Shawl," "Doctor Luke" and others; director of the First National Bank at Buxton and the Northwestern Bank; vice president of the Northwestern Trust Company; died December 19, aged 93, of influenza and pneumonia.

Van Albert Stilley ⊕ Benton, Ky.; University of Louisville Medical Department, 1890; president of the Kentucky State Medical Association; for a period chairman of the committee on public instruction and legislation and for twenty-one years councilor for the first district of the state medical association; secretary of the Marshall County Medical Society from 1900 to 1905 and president in 1906; secretary of the Southwestern Kentucky Medical Association from 1901 to 1907 and served as president in 1908; health officer of Marshall County from 1893 to 1924; field director and public health consultant for the state department of health in western Kentucky for fifteen years; in 1939, after the McCracken County Health Department dedicated new headquarters in Paducah to him, honoring his long years of service in the field of public health in western Kentucky, his photomural and a bronze plaque bearing the dedicatory inscription were hung in the building; served as president of the Bank of Benton; died in the Illinois Central Hospital, Paducah, January 20, aged 77.

William Salant, New York; Columbia University College of Physicians and Surgeons, New York, 1899; Fellow at the Rockefeller Institute from 1901 to 1907; chief, pharmacologic laboratory, bureau of chemistry, U. S. Department of Agriculture, from 1908 to 1918; formerly acting professor of physiologic chemistry at the University of Wisconsin, Madison; professor of physiology and pharmacology at the University of Georgia Medical Department, Augusta, from 1919 to 1929; in charge of pharmacologic investigations, Coldspring Harbor, N. Y., from 1929 to 1932; guest professor of pharmacology at the New York Homeopathic Medical College and Flower Hospital in 1935; member of the American Society for Pharmacology and Experimental Therapeutics, American Physiological Society, American Society of Biological Chemists, Society for Experimental Biology and Medicine and the Harvey Society; fellow of the American Association for the Advancement of Science; died December 10, aged 73, of heart disease.

Lee Cohen ⊕ Baltimore; University of Maryland School of Medicine, Baltimore, 1895; specialist certified by the American Board of Otolaryngology and the American Board of Plastic Surgery; member of the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; in charge of oral plastic surgery at General Army Hospital number 11, Cape May, N. J., during World War I; on the staffs of the Baltimore Eye, Ear and Throat Charity Hospital and the Mount Sinai Hospital; died in the Johns Hopkins Hospital December 31, aged 69, of carcinoma of the bladder.

Giles Waldo Thomas, New York; Harvard Medical School, Boston, 1928; member of the Medical Society of the State of New York and the American Psychiatric Association; research associate, department of psychiatry, Columbia University College of Physicians and Surgeons; diplomate of the National Board of Medical Examiners; on the staff of the Presbyterian Hospital; appointed a captain in the medical corps, Army of the United States, on May 23, 1942; assigned to Station Hospital, Fort Devens, Mass.; honorably discharged Aug. 10, 1943 because of physical disqualification; died January 12, aged 42.

Thomas Collins Denny, Des Moines; Jefferson Medical College of Philadelphia, 1912; member of the Iowa State Medical Society; served the Central Life Assurance Society in various capacities, holding the presidency from 1927 to 1932; formerly medical director of the Iowa Emergency Relief Administration; president of the chamber of commerce in 1933; presented with the Des Moines *Tribune's* Community Service Award for 1934 for his services to civic and community enterprises over a period of several years; died in the Mercy Hospital December 22, aged 56, of coronary thrombosis.

William Isler Wooten, Greenville, N. C.; Jefferson Medical College of Philadelphia, 1920; member of the Medical Society of the State of North Carolina; past president of the Pitt County Medical Society; fellow of the American College of Surgeons; served as a member of the State House of Representatives; a member of the Pitt County Board of Health; a director of the Guaranty Bank and Trust Company; member of the Rotary Club; medical superintendent and associate surgeon, Pitt General Hospital; died December 12, aged 49, of coronary occlusion.

Herman Emil Albrecht ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1911; served during World War I; on the staff of the Presbyterian Hospital; died December 30, aged 56, of angina pectoris.

Louis Peter Alff, Piqua, Ohio; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1878; died December 24, aged 91, of congestive heart disease and hypertension.

Bion Pemberton Allen ⊕ Oriskany, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; died in December, aged 77, of pneumonia.

Allen B. Anderson, Pawnee City, Neb.; Louisville (Ky.) Medical College, 1877; past president of the Nebraska State Medical Association; member of the House of Delegates of the American Medical Association in 1903; for many years pension examiner; died December 27, aged 92, of shock following fracture of femur received in a fall.

Adolph A. Aucoin, Plattenville, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1884; member of the Louisiana State Medical Society; also a pharmacist; at various times a member of the school board of Assumption Parish; died December 18, aged 81, of influenza.

Wilmot Ayres, Beverly Hills, Calif.; Jefferson Medical College of Philadelphia, 1910; assistant surgeon in the medical department of the Pacific Electric Railway, Los Angeles; on

the staff of the California Hospital, Los Angeles; died in St. Vincent's Hospital, Los Angeles, December 23, aged 61, of carcinoma of the floor of the mouth.

Gordon Henry Bahlman, Flint, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1913; member of the Michigan State Medical Society; served during World War I; medical coordinator of civilian defense; past president of the Rotary Club; on the staffs of the St. Joseph Hospital, Women's Hospital and the Hurley Hospital, where he died December 23, aged 56, of virus pneumonia.

Floyd William Bennett Jr., St. Louis; St. Louis University School of Medicine, 1937; died suddenly, December 26, aged 33, of heart disease.

Pierce G. Blanchard ✠ Appling, Ga.; University of Georgia Medical Department, Augusta, 1911; died in the University Hospital, Augusta, recently, aged 55.

Stephen Henry Brown, Columbia, La.; Louisville (Ky.) Medical College, 1897; served as coroner of Caldwell Parish; died November 15, aged 70, of lobar pneumonia.

Lila Owen Baker Burbank, East Liverpool, Ohio; Tufts College Medical School, Boston, 1903; served with the Massachusetts Department of Health; died November 19, aged 73, of diabetes mellitus.

Preston O. Carrico, Ashmore, Ill.; Medical College of Indiana, Indianapolis, 1891; died December 31, aged 81, of asthma and heart disease.

Olen Edgar Chenoweth, Lima, Ohio; Starling Medical College, Columbus, 1903; at one time secretary of the Allen County Medical Society; served during World War I; died December 19, aged 64, of injuries received when he fell down the stairs.

Charles Hiram Churchill, Albuquerque, N. M.; Rush Medical College, Chicago, 1886; died December 29, aged 85, of carcinoma.

Philip James Clark ✠ Fond du Lac, Wis.; University of Wisconsin Medical School, Madison, 1938; on the staff of St. Agnes Hospital; died in Phoenix, Ariz.; December 29, aged 30, of cerebral hemorrhage.

Frank French Clifford, Rochester, Minn.; State University of Iowa College of Medicine, Iowa City, 1885; at various times served as mayor, member of the village council, member of the board of education and as postmaster of West Concord; died in the Colonial Hospital December 30, aged 80, of cardiac decompensation.

Joseph Franklin Cook ✠ Louisville, Ky.; Louisville and Hospital Medical College, 1908; on the staffs of the SS Mary and Elizabeth Hospital, Kentucky Baptist Hospital and the Norton Memorial Infirmary; died December 24, aged 67, of injuries received when he was struck by a truck as he was crossing the street.

Justus H. Cooley, North Plainfield, N. J.; Eclectic Medical College of the City of New York, 1884; at one time mayor of North Plainfield and for many years a member of the board of education; served as school physician of Warren township; died December 31, aged 91, of pneumonia.

James Albert Craig, Greenwood, Ind.; Medical College of Indiana, Indianapolis, 1894; member of the Indiana State Medical Association; died December 25, aged 72, of cerebral hemorrhage.

Robert Bruce Dibble, Pueblo, Colo.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; formerly coroner of Pueblo County; died December 29, aged 69, of arteriosclerosis.

Edgar Dale Downing ✠ Denver; Cooper Medical College, San Francisco, 1911; formerly vice president of the Colorado State Medical Society; member of the Colorado State Board of Examiners in the Basic Sciences; died in Albuquerque, N. M., December 30, aged 56, of acute lobar pneumonia.

Thomas B. Duke, Littlefield, Texas (licensed in Texas under the Act of 1907); member of the State Medical Association of Texas; veteran of the Spanish-American War; served as county health officer; on the staff of the Littlefield Hospital and Clinic; died December 6, aged 68, of cardiorenal disease.

Harry Fisk Hutchinson ✠ Forestville, N. Y.; University of Buffalo School of Medicine, 1902; health officer and school physician; on the staff of the Brooks Memorial Hospital, Dunkirk, where he died December 17, aged 70, of encephalitis following influenza.

George Washington Kelly, Carlton, Ga.; Atlanta College of Physicians and Surgeons, 1911; member of the Medical Association of Georgia; served during World War I; died recently, aged 53, of cerebral hemorrhage.

Eugene Kerr, Baltimore; University of Maryland School of Medicine, Baltimore, 1905; died November 21, aged 72.

Willard Wallace Lemaire ✠ Worcester, Mass.; University of Vermont College of Medicine, Burlington, 1902; served during World War I; died December 27, aged 64, of influenza, pneumonia and coronary thrombosis.

Wallace Isaac Longstreth, Kansas City, Mo.; St. Louis College of Physicians and Surgeons, 1909; member of the Missouri State Medical Association; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; at one time associated with the Indian Service; on the staff of the Veterans Administration Facility, Excelsior Springs, where he died November 8, aged 64, of cerebral thrombosis with hemiplegia.

Donn Hamilton Montgomery, Denver; St. Louis College of Physicians and Surgeons, 1919; died recently, aged 54, of gas bacillus septicemia.

Otto Neustätter, Baltimore; Ludwig-Maximilians-Universität Medizinische Fakultät, Munich, Bavaria, Germany, 1894; at one time scientific director of the Zentrale fuer Gesundheitsdienst der Lebensversicherung of Germany; in 1911 in charge of a division of the International Exhibition of Hygiene in Dresden and collaborator with Professor Sudhoff in the publication of a catalogue on the historical section of the exhibition; emergency committee in aid of displaced foreign physicians fellow in history of medicine, Johns Hopkins University School of Medicine; died December 23, aged 73, of pneumonia.

James Ennis Parramore, Tahlequah, Okla.; Memphis (Tenn.) Hospital Medical College, 1913; medical officer, World War I; died November 13, aged 58, of coronary occlusion.

Emory Albert Powell, Cleveland; Starling Medical College, Columbus, 1895; served on the staff of St. Alexis Hospital; died December 21, aged 80, of coronary thrombosis.

Donald Crane Prentiss, Astoria, Ore.; University of Oregon Medical School, Portland, 1938; acting part time Clatsop County health officer; pathologist, St. Mary's Hospital; died in the Providence Hospital, Portland, December 4, aged 30, of subacute bacterial endocarditis.

Louis Preschel ✠ New York; Long Island College Hospital, Brooklyn, 1916; associate chief otolaryngologist, Stuyvesant Polyclinic; died in the Montefiore Hospital December 16, aged 52, of hypertension.

Millard Reid Purnell, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1891; member of the Louisiana State Medical Society; a medical examiner for the city induction center; died in the Schumpert Sanitarium December 6, aged 74, of carcinoma of the bladder.

Ernest Shurly Ramsdell, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1895; served on the staffs of the Cooper Hospital, Camden, N. J., and the University and Children's hospitals; died December 6, aged 72, of heart disease.

Ernest Paul Rauch, Lancaster, Ohio; Ohio Medical University, Columbus, 1898; died November 20, aged 66, of coronary occlusion.

Glanville Yeisley Rusk ✠ San Francisco; Johns Hopkins University School of Medicine, Baltimore, 1900; member of the American Association of Pathologists and Bacteriologists; professor of pathology at the University of California Medical School; formerly on the staff of the New York Pathological Institute, New York; on the staff of Mount Zion Hospital; died November 22, aged 68.

William T. Sherman, Crown Point, N. Y.; Bellevue Hospital Medical College, New York, 1890; member of the Medical Society of the State of New York; served on the staff of the Moses-Ludington Hospital, Ticonderoga; died in Port Henry December 9, aged 78, of senility.

Isabelle Thompson Smart, New York; New York Medical College and Hospital for Women, New York, 1904; at one time supervisor of the city elementary schools; died December 10, aged 74, of pneumonia.

John Franklin Spencer, Norwood, Ohio; Eclectic Medical Institute, Cincinnati, 1903; died recently, aged 80, of hypertensive heart disease.

Fred E. Steele, Waterbury, Vt.; the Hahnemann Medical College and Hospital, Chicago, 1882; member of the Vermont State Medical Society; past president of the Washington County Medical Society; at one time a member of the state house of representatives and senator; served on the staff of the Vermont State Hospital for the Insane; a charter member of the Montpelier Rotary Club; died December 9, aged 84, of senility.

Francis J. Sullivan, Kankakee, Ill.; Rush Medical College, Chicago, 1897; member of the Illinois State Medical Society; served in the medical corps of the U. S. Army during World War I; senior physician, Kankakee State Hospital; died December 16, aged 66, of cerebral hemorrhage.

Arthur Peter Thompson ✠ Maywood, Calif.; State University of Iowa College of Medicine, Iowa City, 1910; served during World War I; died in a Los Angeles hospital November 10, aged 57, of cerebral hemorrhage.

Alton G. Warner, New York; New York Homeopathic Medical College, New York, 1883; fellow of the American College of Surgeons; formerly on the staffs of the Cumberland Street, Peck Memorial and Prospect Heights hospitals, Brooklyn; died in the Flower and Fifth Avenue Hospitals, December 27, aged 85, of cerebral hemorrhage.

Robert H. Waterford, Chicago (licensed in Oklahoma under the Act of 1908, in Tennessee and Arkansas, years unknown); died December 23, aged 82, of bronchopneumonia and uremia.

Louis Emil Wedel, East St. Louis, Ill.; Barnes Medical College, St. Louis, 1909; member of the Illinois State Medical Society; Spanish-American War veteran; for many years president and member of the public library board; died in the Veterans Administration Facility, Jefferson Barracks, Mo., December 16, aged 64, of heart disease.

Carl Weidner Sr., Louisville, Ky.; Kentucky School of Medicine, Louisville, 1881; member of the Kentucky State Medical Association; also a pharmacist; professor emeritus of hygiene and preventive medicine at the University of Louisville School of Medicine; died December 15, aged 86, of cardiovascular renal disease.

Nettie Weintraub ✠ Kingston, N. Y.; Woman's Medical College of Pennsylvania, Philadelphia, 1934; on the staff of Benedictine Hospital; died in the Ulster County Tuberculosis Hospital December 9, aged 41, of pulmonary tuberculosis and caseous pneumonia.

Adolph Weizenhoffer, Miami Beach, Fla.; Columbia University College of Physicians and Surgeons, New York, 1906; died in St. Francis Hospital December 11, aged 65, of virus pneumonia, exposure and paralysis agitans.

Sara Welt ✠ New York; Universität Zürich Medizinische Fakultät, Switzerland, 1885; served on the staff of the Mount Sinai Hospital, where she died December 26, aged 83, of bronchopneumonia.

William Sholly Wentzel ✠ Sunbury, Pa.; Medico-Chirurgical College of Philadelphia, 1912; served as a member of the Northumberland County local draft board number 3 and as a member of the procurement and assignment board of Northumberland and Snyder counties; on the staff of the Mary M. Packer Hospital; died December 1, aged 54, of cerebral hemorrhage.

William Fleming Willien, Indianapolis; Medical College of Indiana, Indianapolis, 1898; served in the medical corps of the U. S. Army during World War I; at one time on the staff of St. Anthony's Hospital, Terre Haute, Ind.; on the staff of the Veterans Administration Facility, where he died December 14, aged 69, of bronchopneumonia.

Harlan Elrod Wilson ✠ Passed Assistant Surgeon, U. S. Public Health Service, Staten Island, N. Y.; State University of Iowa College of Medicine, Iowa City, 1938; formerly chief medical officer, Federal Correctional Institution, Texarkana, Texas, and on the staff of the U. S. Penitentiary Hospital, Leavenworth, Kan.; died in the New York Hospital December 5, aged 30, of brain tumor.

John Albert Wilson, Columbus, Ohio; Ohio Medical University, Columbus, 1898; died December 5, aged 74, of pneumonia.

Charles Wilmer Wirts ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; served during World War I; on the associate staff, St. John's General Hospital, where he died December 15, aged 70, of primary atypical pneumonitis and chronic myocarditis.

Elizabeth A. Woodworth ✠ Minneapolis; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1901; member of the Society of American Bacteriologists; bacteriologist, city department of health, from 1913 to 1934 and connected with the department since 1901; died in St. Mary's Hospital December 15, aged 79, of carcinoma of the colon.

Andrew R. Wyatt, Fort Wayne, Ind.; Physio-Medical College of Indiana, Indianapolis, 1881; honorary member of the Indiana State Medical Association and the Fort Wayne Medical Society; past president and secretary of the La Grange County Medical Society; formerly health commissioner of La Grange County; at one time a member of the school board of La Grange and a member of the library board; a member of the draft board during World War I; on the staff of the Lutheran Hospital; died December 19, aged 88, of pneumonia.

Richard T. Yoe, Louisville, Ky.; Hospital College of Medicine, Louisville, 1885; member of the Kentucky State Medical Association; served during World War I; died in St. Joseph Infirmary December 6, aged 82, of bronchopneumonia and uremia.

Frederic Berg Zandt, Hamilton Square, N. J.; Medico-Chirurgical College of Philadelphia, 1899; member of the Medical Society of New Jersey; head of local draft board number 4; on the staff of the William McKinley Memorial Hospital, Trenton; past president of the Lions Club; died in St. Francis Hospital, Trenton, December 10, aged 65, of influenza and pneumonia.

Charles Zimmermann, Milwaukee; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1880; member of the State Medical Society of Wisconsin; fellow of the American College of Surgeons; died in Grand Rapids, Mich., December 7, aged 87, of chronic myocarditis and chronic bronchitis.

DIED WHILE IN MILITARY SERVICE

Roy Edwin Ahrens, St. Louis; Washington University School of Medicine, St. Louis, 1941; first lieutenant, medical corps, Army of the United States; died in a Raleigh, N. C., hospital December 13, aged 28, of injuries received in an automobile accident.

Irving Blazar ✠ Providence, R. I.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1937; commissioned a first lieutenant in the medical corps, Army of the United States on Nov. 26, 1943; died in Carlisle Barracks, Pa., December 20, aged 33, of coronary occlusion.

James Peyton Dean ✠ Assistant Surgeon, Lieutenant (jg), U. S. Navy, Chattanooga, Tenn.; University of Tennessee College of Medicine, Memphis, 1941; diplomate of the National Board of Medical Examiners; entered the service of the U. S. Navy on Jan. 9, 1942; a flight surgeon in the Naval Air Corps; died near Rio de Janeiro, Brazil, November 19, aged 28, in an airplane crash.

James Alexander Givan, Worcester, Mass.; Tufts College Medical School, Boston, 1922; member of the Massachusetts Medical Society, Boston Orthopedic Club and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; councilor of Tufts Medical Alumni Association and past president of Tufts Alumni of Worcester County; assistant orthopedic surgeon, Worcester City Hospital; commissioned a lieutenant commander in the medical corps of the U. S. Naval Reserve on Sept. 16, 1942; chief of the orthopedic staff at the U. S. Naval Hospital, Naval Operating Base, Norfolk, Va., where he died November 14, aged 44, of coronary thrombosis.

Rowland William Hall Jr., Clinton, Miss.; University of Arkansas School of Medicine, Little Rock, 1939; member of the Mississippi State Medical Association; first lieutenant, medical corps, Army of the United States; died in London, England, November 4, aged 35, of appendical abscess.

Walter Ovid McCammon, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1935; member of the Kentucky State Medical Association; formerly health officer of Washington County, Ky.; entered the medical corps, Army of the United States, as a first lieutenant on June 15, 1942; promoted to captain; a flight surgeon in the Air Corps; died in Sicily November 14, aged 32, of infarction myocardium.

Gustavus Winzow Thomasson Jr., Dallas, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1936; member of the State Medical Association of Texas; commissioned a captain in the medical corps, Army of the United States, on March 26, 1942 and later promoted to a major; a member of the Air Corps stationed at Childress Air Training and Bombardier School at Childress; killed in Floyd County September 23, aged 31, in an airplane accident.

Bureau of Investigation

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the Federal Security Agency

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J. and foods, F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Bleything Concentrated Vegetable Compounds.—These included "Formula No. 201-A" and "Formula No. 201-B." Bleything Laboratories, Los Angeles. Shipped between Jan. 4 and May 4, 1941. Composition: the No. 201-A consisted of tablets weighing approximately 8 grains each and containing dried plant material yielding less than 1 grain of total mineral constituents; the No. 201-B tablets had the same weight and contained dried plant material yielding less than 1½ grains of total mineral constituents. The first-named product was represented in labeling to supply something which would combat excessive acidity and the second-named to supply minerals which ward off aikalinity. These representations were false and misleading since the articles could not be relied on by physicians and were not effective for the purposes stated. Hence the products were misbranded.—[*D. D. N. J., F. D. C. 632; February 1943.*] Also misbranded under provisions of the law applicable to foods as reported in *F. N. J. No. 3424.*

Bosak's Horke Vino.—Gold Seal Manufacturing Company, Scranton, Pa. Shipped Sept. 4 and Dec. 3, 1941. Composition: essentially small amounts of aloin and strychnine, with alcohol and water. Misbranded because directions on label were inadequate, since this was a laxative preparation. Also misbranded because label statements, "Nature's Tonic . . . This Tonic has been found a valuable aid in cases of Indigestion, Dyspepsia . . . Nervousness, General Debility, and in other derangements of the digestive organs" and ". . . labeled to conform to requirements of New Federal Food, Drug and Cosmetic Law, which is effective June 25th. 1939" were false and misleading, since product was not a tonic, did not possess natural tonic properties bestowed by nature, was not a valuable aid in cases of indigestion, nervousness, general debility and other derangements of the digestive organs, was not labeled to conform to the requirements of the law, and label did not declare the presence and quantity of strychnine present.—[*D. D. N. J., F. D. C. 664; February 1943.*]

Daigneault's Eau de Quinine Hair Tonic.—Joseph Daigneault, Malone, N. Y. Shipped June 3, 1940. Composition: essentially alcohol (59 per cent), water and small amounts of quinine, perfume and coloring matter. Misbranded because of false and misleading statement on label, "prevents falling out and promotes growth of hair," and because label did not accurately declare quantity of contents or correct name and address of manufacturer, packer or distributor.—[*D. D. N. J., F. D. C. 679; February 1943.*]

Effervescent Kruschen Salts.—Johnstone Drug Sales Corporation, Rochester, N. Y. Shipped April 23, 1941. Composition: essentially anhydrous epsom salt (18.7 per cent) with small amounts of common salt (sodium chloride), potassium chloride, sodium sulfate, potassium sulfate, sodium bicarbonate and citric acid. Misbranded because statements in circular accompanying package gave the false impression that the product was an effective agent for reducing weight, stimulating the liver and bowels and acting as a mild diuretic.—[*D. D. N. J., F. D. C. 634; February 1943.*]

Hicks' Quinine Hair Tonic.—J. A. Hicks, Jacksonville, Fla. Shipped June 2, 1941. Composition: essentially alcohol (about 61 per cent by volume), salicylic acid (approximately 0.9 per cent), quinine sulfate, water and perfume. Misbranded because label falsely represented this as effective for eczema, alopecia, dandruff and itching scalp and definitely claimed that it would promote the growth of the hair. Further misbranded because label failed to bear an accurate statement of the quantity of contents and the common or usual names of the active ingredients.—[*D. D. N. J., F. D. C. 643; February 1943.*]

Joint-Ease.—Pope Laboratories, Hallowell, Maine. Shipped Oct. 23, 1940. Composition: essentially salicylic acid and volatile oils, including eucalyptol, camphor, menthol, methyl salicylate and turpentine oil, incorporated in petrolatum. Misbranded because various statements in the labeling and the designs showing portions of the human anatomy represented that the product would be efficacious in treating joint diseases, would ease joints, relieve minor joint aches and pains, muscular lameness, strained muscles, stiff neck and all surface muscular aches and pains and also those affecting the neck, shoulders, elbows, fingers, knees and feet, and would provide a competent treatment for irritations or discomforts due to common colds in nose, throat and chest. These representations were declared false and misleading.—[*D. D. N. J., F. D. C. 635; February 1943.*]

Magozone.—Eastern American Association for Oxygen Therapy, Bloomfield, N. J. Shipped April 17, 1941. Composition: essentially magnesium oxide and peroxide. Misbranded because labeling represented that the product would liberate ozone, eliminate the cause of diseases, restore healthy blood and repair damage; would be efficacious in all ailments due to constipation and faulty assimilation metabolism and elimination which result in gradual poisoning of the system as well as those due to other poisonings of the body; that it was a general purifier for many ailments including gas and poisoning; that it had value in the treatment of nausea, gas in stomach or intestines, headache, dizziness, biliousness and pressure on the heart; that it would be effective in treating diarrhea and ulceration of the digestive tract; that it would purify the blood and lymph vessels and organs; that it would prevent development of parasites, eliminate the causes of disease and restore lost health. Misbranding was further charged in the misrepresentation that another product, namely, "Calozone," would be efficacious in correcting running bowels and treating pus or mucous formation.—[*D. D. N. J., F. D. C. 637; February 1943.*]

Nichol's Long Life For Health.—James B. Nichols, trading as J. B. Nichols and Sons and Nichols Chemical Company, Memphis, Tenn. Shipped Nov. 12, 1940. Composition: plant drugs (unnamed), alcohol (13 per cent by volume) and water. Misbranded in that label falsely represented that it would be efficacious to prolong life, maintain health, treat chest colds, nervousness, weakness, and all cold conditions of the system that cause consumption; that it consisted of two or more ingredients and label did not list their common or usual names or the quantity, kind and proportion of alcohol present; that it was in package form and did not bear label giving name and place of business of the manufacturer, packer or distributor, or accurate statement of quantity of contents in terms of measure, and that container was so made, formed or filled as to be misleading.—[*D. D. N. J., F. D. C. 661; February 1943.*]

Polly Rich Wheat Germ.—Colonial Milling Company, Nashville, Tenn. Shipped between Sept. 15 and 24, 1941. Composition not given. Misbranded because of the following false representations in labeling: that it contains vitamins A, B, E and G; that four level tablespoons of the product contain about the average daily requirement of vitamin B; that it is "nature's own tonic in its pure virgin wholeness . . . the heart or embryo of the grain of wheat is known as 'Wheat Germ.' . . . It contains iron, phosphorus, sodium, potassium, zinc, copper, manganese, calcium and magnesium, all of which are essential to our mineral economy, in forms which are easily assimilated." Further misbranded because falsely represented as efficacious in treating a wide variety of bodily disorders, such as secondary anemia, cataracts, sterility and alcoholic diseases.—[*D. D. N. J., F. D. C. 641; February 1943.*] Further misbranded under provisions of the law applicable to foods as reported in *F. N. J. No. 3222.*

Respirine.—Albert Laboratories, Inc., Chicago. Shipped prior to July 14, 1941. Composition: essentially sugar, water, ammonium chloride, ammonium carbonate, potassium nitrate and alkaloidal plant drugs, including atropine and emodin-bearing drugs. Misbranded because label falsely claimed that the product was highly efficient in alleviating wheezing, sniffing, choking, coughing spells and other respiratory irritations and would relieve "misery" resulting from such symptoms as coryza, asthma, bronchitis, hay fever and choking attacks. Further misbranded because label failed to declare the quantity or proportion of belladonna alkaloids present.—[*D. D. N. J., F. D. C. 644; February 1943.*]

Santé.—Dr. W. B. Caldwell, Inc., Monticello, Ill. Shipped Feb. 12, 1941. Composition: an alcoholic solution containing in each fluid ounce an iron compound representing approximately 150 milligrams of iron and 800 U. S. P. units of vitamin B_1. Misbranded because labeling falsely represented that this was an appropriate treatment for nutritional anemia due to dietary deficiencies or for pale, underweight women with poor appetite; would help the system recover from conditions following colds, la grippe and influenza; would increase personality and stamina, aid in developing the blood, improve the color and appetite and quiet the nerves; would increase weight, promote better sleep and assimilation of food and improve the nerves, stomach and bowels.—[*D. D. N. J., F. D. C. 639; February 1943.*]

Vigor-Tex.—Kretschmer Corporation, Saginaw, Mich. Shipped between May 12 and 17, 1941. Composition: about 42 per cent of wheat germ, the remainder being essentially wheat bran and small amounts of starch. Misbranded because labeling falsely represented that the product would build vitality, promote better health and provide the life principle needed for the functioning of all organs; would correct low spirits, discouragement and weariness, strengthen the heart muscle and normalize the blood pressure; would cause children to thrive, grow in height and weight and improve their appetites and general health; would prevent sleeplessness, poor heart action, fatigue, indigestion and gray hair; would be a preventive and appropriate treatment of constipation, arthritis, neuritis, colitis, colds, simple and pernicious anemia, diabetes, skin blemishes, brittle nails, stomach ulcers, heart trouble, hardening of arteries, high blood pressure, glandular deficiency, acidosis and underweight and overweight conditions.—[*D. D. N. J., F. D. C. 640; February 1943.*]

DANGEROUS TO HEALTH

Because of Inadequate Warnings on Labels

[EDITORIAL NOTE.—These abstracts differ from other abstracts of Notices of Judgment issued by the Food and Drug Administration of the Federal Security Agency which have appeared in these pages in that they deal with nostrums which were misbranded because their labels failed to carry adequate warnings against giving them to children or using them in the pathologic conditions in which they might be dangerous to health, or caution against unsafe dosages or methods of duration of administration or application, for the protection of the user. The abstracts that follow are given in the briefest possible form; (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the date of shipment; (4) the composition; (5) the type of nostrum; (6) the reason for the charge of misbranding, and (7) the date of issuance of the Notice of Judgment.]

Barkolyn.—Standard Medicines Company, Columbus, Ohio. Shipped May 30, 1941. Composition: essentially extracts of plant drugs, including laxatives, and strychnine. Misbranded because label failed to give adequate directions for use, since product was a laxative and labeling suggestions provided for continuous use, which might lead to dependence on a laxative. Also misbranded because directions for use by children were indefinite. Further misbranded because labeling failed to give adequate warnings against use by children or in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or duration of administration, since there was no warning that administration of a product containing strychnine might be especially dangerous to elderly persons. Again misbranded because of lack of warning that a laxative should not be taken by anyone suffering from nausea, vomiting, abdominal pains or other symptoms of appendicitis. Misbranded, finally, because label failed to declare quantity or proportion of strychnine present.—[*D. D. N. J., F. D. C. 663; February 1943.*]

Dickson's Laxative Diuretic.—James B. Nichols, trading as J. B. Nichols and Sons and Nichols Chemical Company, Memphis, Tenn. Shipped Nov. 12, 1940. Composition: essentially epsom salt, with small amounts of caramel, methenamine, hyoscyamine, and salicylic, sulfuric and benzoic acids, strychnine, saccharin and water. Misbranded because labeling did not adequately warn again use in those pathologic conditions wherein product might be dangerous to health or caution against unsafe dosage or methods or duration of administration for protection of users, or against use when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, or warn that frequent or continued use might result in dependence on laxatives. Further misbranded because statements on label falsely represented that each bottle contained 8 ounces of the substance, which it did not; that the mixture would aid in eliminating and correcting disorders of the alimentary canal, urinary organs, biliousness, headache, stomach gas and backache. Also misbranded in that it consisted of two or more ingredients and label did not declare common or usual name of each, as well as quantity or proportion of hyoscyamine and strychnine. Again misbranded because the designation "Utropian" did not properly identify the methenamine present. Misbranded, finally, because label failed to declare quantity of contents in terms of measure and bottle was so made and formed as to be misleading.—[*D. D. N. J., F. D. C. 661; February 1943.*]

Dickson's Laxative Rheumatic Diuretica.—A. H. Dickson, Memphis, Tenn. Shipped Nov. 7, 1941. Composition: essentially epsom salt, methenamine, sodium salicylate, sodium benzoate, salicylic acid, methyl salicylate and caramel coloring. Misbranded because labeling did not give adequate directions for use, particularly as to duration and limitation, since a laxative should not be taken often. Further misbranded because label failed to give adequate warning against administering to children or against use in those pathologic conditions wherein it might be dangerous to health, or caution against taking when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present, or warn that frequent or continued use might result in dependence on laxatives. Also misbranded because label falsely represented that the product would be efficacious for rheumatic, urinary and constipated conditions.—[*D. D. N. J., F. D. C. 704; April 1943.*]

Grover Graham Remedy and Graham's Pills.—S. Grover Graham Company, Inc., Newburgh, N. Y. Shipped Jan. 20 and July 15, 1941. Composition: the first-named was essentially a mixture of magnesia, sodium bicarbonate, sodium bromide, extract of ginger and a small amount of chloroform with alcohol and water, flavored with peppermint oil and colored with a violet red dye. The pills contained aloe, podophyllin, gamboge and capsicum. The "Remedy" was misbranded because label did not bear adequate directions for use, since those given provided for an excessive amount of sodium bromide and no limitation was put on the amount of bromide to be administered daily. Further misbranded because label failed to warn adequately against use in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or methods or duration of administration, since it did not caution the user that frequent or continued administration might lead to mental derangement, skin eruptions or other serious effects, and that it should not be taken by those suffering from kidney diseases. Also misbranded because label falsely represented that the product would be efficacious for indigestion, bloating, dyspepsia, gastritis, constipation and other forms of stomach disorders and distress due to faulty digestion, and that it was harmless and non-habit forming. Graham's Pills were misbranded because represented as being an intestinal eliminant.—[*D. D. N. J., F. D. C. 665; February 1943.*]

Norwich Laxative Cold Tablets.—Norwich Pharmacal Company, Norwich, N. Y. Shipped Nov. 7, 1941. Composition: in each tablet 1 grain of acetanilid and unnamed amounts of podophyllin, aloin, and other drugs of plant origin, including quinine, camphor and cayenne pepper. Misbranded because label did not bear adequate warnings against unsafe duration of administration, for protection of users, since it failed to warn the consumer that frequent or continued use might be dangerous to health in causing serious blood disturbances, anemia, collapse, or dependence on the drug, and that it should be discontinued if skin rash appears. Further misbranded because of label representations that product would affect the underlying cause of the common cold, prevent its full development and shorten its duration, whereas its therapeutic efficacy is limited to that of an analgesic and laxative which might temporarily ameliorate some of the symptoms of the common cold but not those of feverishness, tickling throat sensations and running of the nose.—[*D. D. N. J., F. D. C. 667; February 1943.*]

Pinex.—Pinex Chemical Company, Kinston, N. C. Shipped Oct. 1, 1941. Composition: acetanilid (not more than 3.6 grains per fluid ounce), alcohol (not in excess of 10.9 per cent), small amounts of menthol, camphor, laxative plant drugs, ammonia, licorice, ammonium chloride, and a trace of alkaloids. Adulterated because its strength differed from that indicated on the package, namely, "Acetanilid 6 Grs to oz Maximum Alcohol 20 per cent." Misbranded because of inadequate label directions for use, since those given provided for continuous administration and hence were inadequate for a laxative, since the product, when taken in such manner, might create a dependence on laxatives. Further misbranded because label did not adequately warn against giving to children or use in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or duration of administration. Misbranded, also, because name of product and designs of pine trees on label and carton gave the impression that the product contained something derived from pine, whereas it did not, nor did it offer any ingredient or combination of ingredients capable of preventing or curing either head or chest colds or alleviating their common symptoms. Misbranded, finally, because label statements (required by law) of active ingredients, and total quantity of contents and directions for use were not sufficiently conspicuous on the label to render them likely to be read or understood by the ordinary individual.—[*D. D. N. J., F. D. C. 668; February 1943.*]

Samaritan Treatment Preparations—Sterile Solution Formula No. 3, Rx Formula No. 8 and S.G.M. a. (Oral).—The Samaritan Treatment, Chicago. Shipped Dec. 31, 1940. Composition: Sterile Solution Formula No. 3: a solution of strychnine, emetin, ephedrine, pilocarpine and sparteine; Rx Formula No. 8: capsules each containing approximately 0.6 Gm. of a powder composed chiefly of iron and ammonium citrate; S.G.M.a. (Oral): capsules each containing animal materials including 0.16 grain of thyroid. These capsules were declared misbranded because the labeling failed to give adequate directions for use, in that it did not sufficiently warn against administering the product to children or using it in those pathologic conditions wherein it might be dangerous to health, or caution against unsafe dosage or methods or duration of administration. Also misbranded because package failed to give name and place of business of manufacturer, packer or distributor, or quantity of contents or common or usual name of the article, or amount of thyroid that it contained. The two other preparations were declared misbranded largely for the reasons given above.—[*D. D. N. J., F. D. C. 671; February 1943.*]

Special Formula Tablets.—Arner Company, Buffalo. Shipped Oct. 15, 1941. Composition: boric acid and an effervescent mixture of soda and citric acid. Misbranded because label failed to give adequate directions for use and sufficient caution against giving to children, which omission might constitute danger to health, and against unsafe dosage or duration of administration for protection of users, since label carried no warning that repeated daily administration would cause deleterious systemic effects and injurious gastrointestinal disturbances. Further misbranded because label did not give common or usual name of each active ingredient.—[*D. D. N. J., F. D. C. 669; February 1943.*]

Special S. C. White Pills Rx 2609.—Charles H. Dietz, Inc., St. Louis. Shipped Nov. 22, 1941. Composition: label declared each pill to contain aloes, ¾ grain; ferrous sulfate, 1¼ grains, and oil of pennyroyal, ¼ minim. Misbranded because label did not give adequate directions for use and failed to caution sufficiently against use in those pathologic conditions wherein it might be dangerous to health, since label did not warn that product should not be taken when nausea, vomiting, abdominal pains or other symptoms of appendicitis are present, or caution against unsafe dosage or duration of administration, since frequent or continued use might result in dependence on a laxative.—[*D. D. N. J., F. D. C. 670; February 1943.*]

Vinco Herb Tablets.—Vinco Herb Company, Dayton, Ohio. Shipped Oct. 28, 1940. Composition: essentially aloe and extracts of plant drugs including capsicum and an emodin-bearing substance. Misbranded because not properly labeled to warn against use by young children or in conditions wherein it might be dangerous to health, since label did not caution user that frequent or continued administration might result in dependence on laxatives. Further misbranded because falsely represented on label to be an appropriate treatment for coated tongue, flatulence, sour stomach simple headache, acid indigestion, dull eyes, sallow skin and some other disorders, make life happy and enjoyable and provide a clean, healthy condition of the mind and body.—[*D. D. N. J., F. D. C. 619; February 1943.*]

Correspondence

"FLUORIDE AND DENTAL CARIES"

To the Editor:—I wish to call your attention and that of your readers to several rather serious flaws in the review "Fluoride and Dental Caries" published in Current Comment (THE JOURNAL, January 8, p. 98). This survey is unfortunate in that it fails to provide the reader with the most essential of the three lines of evidence proving a relation between fluorine and dental caries. Furthermore, it creates an erroneous impression with regard to the history of discoveries bearing on this problem, and, finally, it contains a serious error in factual statement regarding the production of mottled enamel by topical application of fluorine. While the epidemiologic studies referred to (Dean, H. T.: *Pub. Health Rep.* **53**:1443 [Aug. 19] 1938) and later investigations by Dean and his co-workers have furnished substantial and convincing evidence for the protective action of fluorine against dental caries, these studies were not the first to indicate the role of fluorine in promoting caries resistance. This relationship might have been surmised in 1931 when higher than usual concentrations of fluorine in drinking water were discovered (Smith, M. C.; Lantz, E. M., and Smith, H. V.: *Arizona Agr. Exp. Sta. Tech. Bull. 32*, 1931. Churchill, H. V.: *Indust. & Eng. Chem.* **23**:996, 1931) to be the factor responsible for the occurrence of mottled enamel. It had already been noted by F. S. McKay (*J. Am. Dent. A.* **15**:1429, 1928) that mottled teeth, in spite of their abnormal structure, apparently develop fewer caries than teeth not exhibiting detectable mottling.

Actually, the first objective evidence for the protective role of fluorine in relation to caries was presented early in 1937 at meetings of the International Association for Dental Research (Armstrong, W. D., and Brekhus, P. J.: *J. Dent. Res.* **16**:309, 1937) and the American Society of Biological Chemists (Armstrong, W. D.: *J. Biol. Chem.* **119**:v, 1937). These investigations, which were later described in greater detail (Armstrong, W. D., and Brekhus, P. J.: *J. Dent. Res.* **17**:393 [Oct.] 1938) demonstrated a significantly higher fluorine content of the enamel removed from sound teeth than was present in the undecayed enamel of carious teeth. Considerations were offered to indicate that the low fluorine content of the enamel of carious teeth was not secondary to the carious process.

Apart from the fact that the review is inaccurate from the historical standpoint, it is incomplete in that one of the major lines of evidence indicating the relationship of fluorine to resistance to dental caries is not presented to the reader. As the review states, the two other lines of investigation in this connection are (*a*) epidemiologic surveys, which have shown an inverse relationship between the prevalence rates of dental caries and the fluorine content of communal water supplies, and (*b*) the demonstration that extra fluoride supplied to rats under a variety of conditions decreases the incidence of experimental caries in this species. The third line of evidence referred to, derived from studies of chemical composition of sound and carious teeth, was omitted entirely although it was the first definitive evidence on the question and is still the most significant fact known about dental caries resistance. This is the fact that enamel from the sound portions of carious teeth have significantly and consistently low fluorine content, as compared with that of noncarious teeth from the same or other individuals. Without this knowledge it would still be impossible to formulate a rational view of the role played by fluorine in caries resistance and prevention.

The last sentence of the review states absolutely erroneously in connection with the discussion of the results of topical application of fluoride to the teeth as a means of reducing the incidence of dental caries, that it will be necessary to determine the minimum effective concentration since an excess of fluoride is bound to produce mottled enamel. Contrary to this assertion, the facts are clear in demonstrating that there is no possibility of producing mottled enamel by the topical application of a solution of fluoride of any concentration to the erupted teeth. Mottled enamel results only when fluoride above threshold amounts is absorbed during the period of enamel formation. The elimination of the possibility of producing some degree of mottled enamel is one of the advantages which the method of topical application of fluorides to teeth as a means of reducing the incidence of caries possesses over the alternative method, namely addition of fluorine to public water supplies.

MAURICE B. VISSCHER, M.D.,
University of Minnesota,
Minneapolis.

To the Editor:—The editorial comment on the effect of fluoride in inhibiting dental caries in THE JOURNAL, January 8, was excellent. It calls attention to the awakened interest in controlling this disease by other than strictly mechanical means and points up the fact that there are biologic methods other than dietary which may bring about a diminution in the incidence of caries.

It is interesting that, as a result of the laboratory and clinical studies mentioned in the comment and others, fluoride is now being considered the active principle which may accomplish the desired result. During the investigations on endemic dental fluorosis and the relationship of this condition to lowered incidence of caries there was a feeling that fluoride may have been merely an indicator, not the actual active principle.

Attention should be directed to the fact that fluoride is not the only substance which may have similar action on caries. Clinical studies have been conducted on a quinine-urea combination which seems to have a similar inhibitory action (Wach, E. C.; O'Donnell, J. F., and Hine, M. K.: Effects of a Mouth Rinse on Oral Acidogenic Bacteria, *J. Am. Dent. A.* **29**:61 [Jan.] 1942). Laboratory data have been accumulated on the action of iodoacetate which is inhibitory to experimental production of caries in rats (Dale, P. P., and Powell, V. H.; Inhibition of Experimental Dental Caries in Rat by Iodoacetic Acid, *J. Dent. Res.* **22**:33 [Feb.] 1943). Likewise some of the synthetic detergents act to inhibit the drop in p_H of dental plaque material which otherwise occurs after ingestion of carbohydrates and especially sugars (Stephan, R. M.: Changes in H Ion Concentration on Tooth Surfaces and in Carious Lesions, *J. Am. Dent. A.* **27**:718 [May] 1940. Stephan, R. M., and Miller, B. F.: A Quantitative Method for Evaluating Physical and Chemical Agents Which Modify Production on Acids in Bacterial Plaques on Human Teeth, *J. Dent. Res.* **22**:45 [Feb.] 1943; Effect of Synthetic Detergents on p_H Changes in Dental Plaques, *ibid.*, p. 53). These studies indicated that intensive research is being carried on to determine the worth of various materials which may interfere with the mechanism of cavity production in the teeth.

One final comment on the comment. The last sentence states that "an excess of fluoride is bound to produce chronic dental fluorosis." It has been definitely established that chronic fluorosis is produced only when dentally toxic (over 1 part per million) amounts of fluoride are imbibed in the drinking water during the period of formation of enamel, and the enamel of each individual tooth is completed on an average of two to three

years before its eruption. Once this enamel formation is complete the only alteration in its structure is decalcification. Therefore it would be impossible for topically applied fluoride to produce fluorosis.

HENRY M. WILBUR, D.D.S., Omaha.
Assistant Professor of Dental Hygiene and Public Health, University of Nebraska College of Medicine.

MESENTERIC INJURY DUE TO NONPENETRATING ABDOMINAL TRAUMA

To the Editor:—I wrote to Dr. D. Henry Poer, Atlanta, Ga., concerning the article by him and Dr. Edward Woliver on intestinal and mesenteric injury due to nonpenetrating abdominal trauma (THE JOURNAL, Jan. 3, 1942, p. 11). The letter was returned, however, since he is in the armed services.

In this article no mention was made of patients with mesenteric injury and no elaboration of his group A patients i. e. with delay more than twelve hours after the accident. If you have these data I would appreciate information on patients with injury to the mesentery and also how long over twelve hours some of the patients waited before seeing a doctor.

I just attended a man who had a heavy door fall on his abdomen and chest and seventy-two hours later intestinal obstruction developed as the result of 7 feet of intestine going through an opening in the terminal ileocecal mesentery.

HARRY S. FRANK, M.D., Middletown, Conn.

[The query was forwarded to Dr. Poer, who replied:]

To the Editor:—Emory University has recently forwarded your letter of 10 December 1943 to me in which you ask for additional information. I have reviewed all the notes I have available and find some information which may be of interest.

In our group A patients only 1 had mesenteric injury. and this was a man aged 30 who was crushed tangentially between two moving streetcars. He had severe injury to the abdominal wall with rupture of the rectus muscle, and at operation the mesentery was found to be torn but not seriously. This patient was operated on within two hours and recovered uneventfully.

With regard to the question of delay, 7 of our patients who were operated on and recovered came to the hospital twenty hours or more after injury. Three of these came in after forty-eight hours. The jejunum or ileum was injured in all of them except 1, who had a severe retroperitoneal hematoma without other complication. One was thrown from a horse and another from an automobile, and still another was struck in the abdomen during a basketball game. Another patient sustained his intestinal injury as the result of the forcible attempt to reduce a hernia. Another was kicked by a mule and still another was struck in the abdomen by a piece of lumber which was thrown from a saw.

DAVID H. POER, Lieutenant Colonel, M. C.,
Martinsburg, W. Va.

PREGNANCY TEST FROGS BEING BRED AT WILL

To the Editor:—In 1939, at the Annual Fortnight on Endocrinology at the New York Academy of Medicine, the African frog test for the diagnosis of pregnancy was first introduced in the United States. Since then the only drawback to the universal use of this frog, Xenopus laevis, in pregnancy diagnosis has been the difficulty in obtaining sufficient animals for all who have been interested in the test. The outbreak of worldwide hostilities made importation of animals from South Africa a hazardous undertaking, and our own supplies of Xenopus have been arriving at irregular intervals.

Attempts at breeding these animals in America prior to 1943 met with only sporadic success, and from the meager results obtained few, if any, of these frogs became available for general use.

Heartening news has come to us from Switzerland, where Gasche (1943), despite the restrictions of war-torn Europe, has succeeded in breeding Xenopus laevis and bringing them to maturity at will. His paper (Die Zucht von Xenopus laevis Daudin und ihre Bedeutung für die biologische Forschung, *Rev. Suisse de Zool.*, Geneva **50**:262, 1943) has recently arrived in this country, and from his description and results it would appear that literally tens of thousands of these valuable animals can be made available in a six months period.

In essence, Gasche simply used the technic suggested by Shapiro in 1939 and injected both male and female Xenopus laevis frogs with urinary gonadotropic hormones. Mating and spawning followed within eight hours of injection.

We have now made arrangements to breed these animals in New York and it is our firm belief that, once obtainable in considerable numbers, Xenopus laevis will entirely replace rabbit, rat and mouse as indicators of pregnancy.

This note should be encouraging to other workers in this field, and both institutions with which we are affiliated plan to aid in making the results of our research available to all who are interested.

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The New York Zoological Society and the Departments of Gynecology and Pathology of the Jewish Memorial Hospital.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Feb. 5, p. 386.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral. Part II.* Chicago, June 12-16. Final date for filing application is March 12. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various large cities, May 8. *Oral.* Chicago, June 9-10. Final date for filing application is April 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various centers, Oct. 16. Candidates in military service may take examination at their place of duty. Final date for filing application is August 15. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY. *Written. Part I.* Various centers, Feb. 12. Candidates in military service may take Part I at their place of duty. *Oral. Part II.* Pittsburgh, June 7-13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 5-7. Sec., Dr. S. Judd Beach, P. O. Box 1940, Portland, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* New York City, June 1-4. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Oral.* New York, March 25-26, and San Francisco, May 6-7. Sec., Dr. C. A. Aldrich, 115½ First Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Written.* Various centers, March 31. *Oral.* Philadelphia, May 12-13. Final date for filing application is Feb. 29. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF UROLOGY: *Oral.* Chicago, Feb. 15-17. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Alleged Negligence in Diagnosis and Removal of Cyst from Neck.—The plaintiff and her husband consulted the physician defendant relative to a cyst on the plaintiff's neck just under the ear. The physician felt of the cyst and informed them that it was small and could be removed without difficulty in about ten minutes at his office but that he preferred to perform the procedure at a hospital and that within thirty minutes after the patient entered the hospital she would be out. The patient then went to a hospital and after administering a local anesthetic the physician proceeded to remove the cyst. Apparently after the defendant had made a small incision and before he had commenced to operate he discovered that the cyst was embedded much more deeply than he had thought and, to use his expression, "I found out I had gotten into a mess," but while he informed his patient that the cyst was "a little deeper than he thought" he did not inform her of the exact situation nor did he ask her opinion as to whether he should proceed with the operation. According to the patient, while the operation was in progress, the physician said: "Uh, uh, I have done the wrong thing" and at that time she felt "like something terrible had happened, that everything had just fallen out, her whole nerves." The physician described the procedure as follows:

> During the operation we found that this cyst instead of being a small cyst about the size of the end of your thumb had actually extended down between some muscles, which is very unusual. We were trying to make a small incision without making any more scar than necessary, and we cut down on the thing with knife through the skin. We got along fairly well. It took more time than I thought it would. I thought when I examined it that I could take it out in ten minutes and that is what I told her in the office. I had taken out hundreds of them, and I never had had one that went down like this one did; and when I saw how it was, I could have stuck a hole in it and let the water out and stopped then, but it would have come right back, wouldn't have been any trouble at all. I could have backed right out and wouldn't have had anything, but men doing surgery have to do the best they can when they get into a mess. This was a mess. It was deep-seated, a thin wall cyst, and I was doing my best to get it out with as little trouble as I could.

Just what happened during the operation is not clear but apparently the facial nerve was stretched and the end result was unfortunate. The patient's mouth became drawn to one side, her tongue became partially paralyzed, she was unable to chew on one side and had no sense of touch on that side of her face. At times she could "hardly swallow," and tear ducts in the eye on that side would fill up and the "eye weeps and won't close." Subsequently the patient sued the physician for malpractice, alleging negligence in the diagnosis made by him at his office and in his performance of the operation at the hospital. From a judgment in favor of the plaintiff, the physician appealed to the circuit court of appeals, fifth circuit.

At the trial the plaintiff offered no expert medical testimony, relying on the testimony of herself and her husband as to the circumstances attending the making of the diagnosis and the performance of the operation, including what the physician discovered after the operation was commenced, and what he said during and after it. The physician testified, in effect, and two other physicians corroborated him, that in making the diagnosis in question and in performing the operation he possessed and exercised a reasonable degree of care and skill. He contended that in the absence of expert testimony as to his alleged negligence there could be no judgment against him. The patient, on the other hand, insisted that the disastrous results of the operation in contrast with the physician's original diagnosis, on which her consent to the operation was based, and the testimony referred to, raised an issue of fact as to whether or not looking at the diagnosis and operation as a whole the physician had in respect to them exercised a reasonable degree of care and skill and otherwise conducted himself as is required by law of a physician. It is settled law in Georgia, said the circuit court of appeals, the state in which the diagnosis and operation was made and performed, that a physician does not guarantee the results of a treatment or operation and that proof alone that an operation is different in its outturn from that expected, or is followed by disastrous instead of beneficial results, neither establishes nor supports an inference of want of proper care, skill or diligence. In view, therefore, in the absence of expert opinion evidence that the physician did not, and the presence of such evidence that he did possess and exercise reasonable care and skill, both in making the correct diagnosis before he actually physically performed, and in physically performing the operation, we should, in the absence of other issues, feel compelled to order judgment for the physician. None of the statements alleged to have been made by the physician to his patient were sufficient to supply the critical absence of expert opinion evidence.

However, the court concluded that even though the issue had not been raised in the pleadings, it had the right to consider the question as to whether or not the physician did not breach the obligation that he owed his patient when, after making the incision and ascertaining that the operation would not be the absolutely simple one he had secured the patient's consent to perform, but a serious and difficult one fraught with possible, if not probable dangers, he went ahead without making full disclosure of the difficulties attending, and the possible dangers of, the operation and securing her consent to go forward under the new found conditions. The law, continued the court, is well settled that an operation cannot be performed without the patient's consent and that one performed without consent, express or implied, is a technical battery or trespass for which the physician is liable. The obligation underlying this rule is not satisfied by a consent obtained under a mistaken diagnosis that the operation is simple and without danger, when a later diagnosis, while the patient is still conscious and no emergency exists, discloses that the operation is both difficult and dangerous. The rule extends no further than to hold that if a physician advises his patient to submit to a particular operation and the patient weighs the dangers and results incident to its performance and finally consents, he thereby in effect enters into a contract authorizing the physician to operate to the extent of the consent given but no further. The same principle which supports the holding that a physician performing an operation without the patient's consent, express or implied, commits a battery or trespass for which he is liable in damages, also supports the holding that a physician may not perform an operation different in kind from that consented to or one involving risks and results not contemplated.

In view of the circumstances, the court could not say that a verdict for the physician was demanded or that the judgment in favor of the patient should be affirmed. The correct issue, the court thought, was whether or not the physician in proceeding with the operation as he did after discovering its true character committed a trespass on his patient or a breach of his obligation to exercise the care and skill required of him. This issue was not developed and tried as it should have been in the trial court. The court accordingly reversed the judgment in favor of the patient and remanded the cause for a new trial.—*Wall v. Brim, 138 F. (2d) 478 (1943).*

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.

National Conference on Medical Service, Chicago, February 13. Dr. C. L. Palmer, 500 Penn Avenue, Pittsburgh 22, Secretary.

New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

27:657-810 (Nov.) 1943

*Differential Diagnosis of Lymphogranuloma Venereum and Chancroid by Laboratory and Skin Tests. L. W. Knott, L. H. T. Bernstein, H. Eagle, T. E. Billings, R. L. Zobel and E. G. Clark.—p. 657.
Extent of Syphilis Problem at Beginning of World War II. R. A. Vonderlehr and Lida J. Usilton.—p. 686.
Observations on Specificity of Frei Test in Army Personnel Using Lygranum Antigen. A. Gelperin.—p. 697.
Treatment of Chancroid with Sulfathiazole. F. C. Combes, O. Canizares and S. Landy.—p. 700.
Method of Transmitting Gonococcus Culture Specimens Through the Mail D. Bergsma and R. Stein.—p. 703.
Clinical Diagnosis of Uncomplicated Syphilitic Aortitis. P. E. Mattman and J. E. Moore.—p. 711.
Experimental Prophylaxis of Gonococcal Infections. F. B. Bang.—p. 716.

Differential Diagnosis of Lymphogranuloma Venereum and Chancroid.—Knott and his collaborators studied the Ito-Reenstierna test, the Frei test, the lygranum skin test, the lygranum complement fixation test and changes in the serum protein and in serum albumin-globulin ratio in the differentiation of chancroid and lymphogranuloma venereum. The groups studied were 44 patients with chancroid, 31 with lymphogranuloma inguinale, 18 with lesions other than lymphogranuloma venereum, chancroid or syphilis, 11 contacts of patients with the aforementioned lesions, 78 with early syphilis and 20 normal controls. An initial diagnosis was made on the basis of the history and physical examination without regard to the subsequently observed results of the skin or laboratory tests. In the differential diagnosis of buboes due to lymphogranuloma venereum and chancroid the criteria suggested by Brandt and Torpin were found helpful. The Ducrey vaccine was used for the skin tests. All patients were tested with a pus antigen of lymphogranuloma venereum. After the study was begun a suspension of the lymphogranuloma virus grown in egg yolk sac (lygranum) and the control antigen derived from uninfected eggs became available, and all subsequent patients were tested with both the pus and cultured antigens. The skin test was repeated on many patients after six weeks and again at the end of three months. The results of the diagnostic skin tests (Ito-Reenstierna, Frei and lygranum) for chancroid and lymphogranuloma venereum should be interpreted with caution. A positive reaction does not necessarily establish the diagnosis, and a negative reaction does not exclude it. The specificity of the lygranum complement fixation test is challenged by the large number of positive reactions found in the serums of patients giving no history and presenting no clinical signs of the disease and also by the possible cross reactivity with other venereal diseases, particularly syphilis. In a case of syphilis the initial results of the lygranum complement fixation procedure are unreliable and the test should be repeated throughout the course of the antisyphilitic therapy. Biologic false positive tests for syphilis occur with surprising frequency in cases of chancroid, lymphogranuloma venereum and other types of nonsyphilitic genital lesions; therefore arsenic therapy should not be initiated on a patient with a dark field negative genital lesion and a low titered serologic test. The determination of the total serum protein and albumin-globulin ratio is of little value in the differential diagnosis of genital lesions. The best criterion in the differential diagnosis of chancroid and lymphogranuloma venereum remains the clinical appearance of the lesion. The skin reactions and serum tests are at best of confirmatory value.

Archives of Dermatology and Syphilology, Chicago

48:579-708 (Dec.) 1943

*Actual Causes of Certain Occupational Dermatoses: Study of 527 Cases, with Special Reference to Dermatoses Due to Mineral Oils. J. V. Klauder.—p. 579.
Effect of Androgen on Sebaceous Glands of Human Skin. H. R. Rony and S. J. Zakon.—p. 601.
Vitiligo of Upper Lip in Players of Wind Instruments. C. W. Freeman and H. H. Hazen.—p. 605.
Necrobiosis Lipoidica Diabeticorum with Xanthoma Cells: Case. L. Nicholas.—p. 606.
Dermatitis Due to Nail Polish: Report of 2 Cases with Experimental Studies. H. Keil, J. J. Russo and L. S. Van Dyck.—p. 612.
Production of Bullae in Skin of Duck: II. Experiments with Bullae Produced by Vesicants. L. Goldman, N. Nelson and I. A. Mirsky.—p. 616.
Complement Fixation Test for Lymphogranuloma Venereum: Results Obtained with Its Use. A. W. Grace and G. Rake.—p. 619.
Syphilitic Juxta-Articular Nodules. F. Kalz and B. L. Newton.—p. 626.
Virus Diseases of Skin, with Special Reference to Elementary and Inclusion Bodies: I. Variola-Vaccinia and Molluscum Contagiosum. M. H. Ebert and M. Otsuka.—p. 635.
Acanthosis Nigricans: Is It a Form of Avitaminosis? L. Hollander.—p. 650.

Causes of Occupational Dermatoses.—Klauder made a study of 1,113 cases of cutaneous diseases in patients who presented claims for compensation. The condition in 527 was diagnosed as occupational in origin and in 586 as nonoccupational. Of the 527 occupational dermatoses 131 were caused by trauma and accidental injury, 128 by primary irritants (acids, alkalis, solvents), 86 by cleansing agents applied to the skin, 66 by sensitizing substances, 45 by petroleum products and 48 by wet work. There were 21 cases of occupational folliculitis caused by chlorinated hydrocarbons, vegetable oil and dust. Trauma and accidental injury caused pyoderma, dermatitis, ulcer of the leg, traumatic herpes zoster, alopecia areata, psoriasis, anthrax, erysipeloid and sporotrichosis. Primary irritants include solvents, alkalis, chromic acid and chromates, pigments and dyes, paints and varnishes and acids. Volatile solvents were the cleansing agents which most frequently caused dermatitis. They included gasoline, type wash, turpentine, paint thinner, kerosene, naphtha, alcohol and toluene. Substances causing sensitization dermatitis included petroleum products, anticorrosion oils, linseed oil, a powder used as a germicidal detergent for glasses, solution through which nylon thread ran on knitting machines, a varnish made from the oil extracted from cashew nuts, ingredients used to cover colored paper and cardboard, phenol-formaldehyde resin products, chrysanthemums, ragweed, feverfew, vanilla, cinnamon, insecticides, glues, trinitrotoluene, and permanent wave and scalp lotions. Mineral oils causing dermatoses were metal working oils, rust preventive compounds and the like. Oil folliculitis is the most frequent dermatosis in workers exposed to lubricating oils. Workers handling wire covered with halowax, a chlorinated naphthalene, frequently develop a folliculitis. Employees of sugar refineries develop sugar folliculitis. Dermatitis caused by wet work was seen in nurses, barbers, beauty parlor operators, janitors, scrub women, kitchen workers and soda fountain clerks. Workers should not be compelled to keep their hands wet with solution for hours at a time. All workers engaged in wet work should use an emollient at the end of the work day.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

70:1-90 (Nov.) 1943

*Scrub Typhus. A. J. Corbett.—p. 34.
Early Medical Service in New Guinea. L. S. Eagleburger.—p. 55.
*Pseudo Bronchiectasis Following Atypical Pneumonia. B. Blades and D. J. Dugan.—p. 60.
Dental Ward in Station Hospital. F. A. Tyler.—p. 69.
Spray Process for Making Whole Egg Powder. J. Payton.—p. 71.

Scrub Typhus.—Corbett points out that in the Pacific area there is a typhus-like disease known as tsutsugamushi fever. It is known under a number of names, such as tropical typhus, mite bite fever, scrub typhus, rural typhus and Japanese river fever. These diseases have a common etiologic agent, namely Rickettsia orientalis. They are similar clinically, serologically and pathologically with one exception, in that the mite bite fever of Sumatra does not present a primary skin ulcer. The disease differs from murine typhus, epidemic typhus and Rocky Mountain spotted fever principally by being mite borne and by its serologic reaction. Scrub typhus causes agglutination with

Bacillus proteus vulgaris OX, Kingsbury strain, and does not cause agglutination with B. proteus vulgaris OX 19. Scrub typhus is usually characterized by an abrupt onset, high fever, severe headache, photopsia and occasionally dizziness, nausea and vomiting. The febrile course is of the high remitting type varying from 101 to 103 F. A primary eschar is usually present. On the sixth to the eighth day a maculopapular rash appears on the trunk, arms and legs. Frequently there is a definite diminution in hearing. In severe cases cerebral symptoms may be pronounced. Generalized lymphadenopathy is a characteristic finding, the enlarged nodes being somewhat tender. Those draining the area of the primary eschar are involved to a greater extent. The patients usually present a rapid and sometimes irregular pulse and an increase in respiratory rate. As a rule the disease terminates at the end of the second week in rapid lysis, when the subjective and objective symptoms regress rapidly. The convalescence is lengthy and uneventful save for protracted physical exhaustion. Death is usually the result of cardiac failure, frequently with complicating bronchopneumonia.

Pseudo Bronchiectasis Following Atypical Pneumonia.—Blades and Dugan point out the difficulties in differentiating between atypical pneumonia and pulmonary tuberculosis and certain potentially surgical diseases of the chest. A sharply localized zone of atelectasis in a roentgenogram may suggest a pulmonary tumor, and basilar densities in the roentgenogram of a patient with chronic productive cough might lead to a diagnosis of bronchiectasis. Delineation of the bronchi with radiopaque oil will, under ordinary circumstances, settle the diagnostic problem. The authors demonstrated that, following atypical pneumonia, iodized oil bronchograms may occasionally give the erroneous impression of a true bronchiectasis. The temporary nature of the bronchial dilatations was proved by visualization of the bronchi a few weeks later, showing a complete return to normal bronchial configuration. If one is aware that atypical pneumonia is capable of producing temporary dilatation of the bronchi, an early or dry bronchiectasis could for a time be considered a pseudo bronchiectasis. Progression of symptoms and repeated demonstration of the bronchial dilatation would soon establish the correct diagnosis. Failure to consider the possibility of a pseudo bronchiectasis might result in unnecessary resection of lung tissue.

Connecticut State Medical Journal, Hartford

7:811-878 (Dec.) 1943

How the Flying Fighters' Doctor Is Made. E. G. Reinartz.—p. 820.
Anxiety and Fatigue. F. J. Braceland and H. P. Rome.—p. 827.
Subacute Meningococcal Septicemia: Report of Case. W. F. Smith. —p. 832.
Congenital Deformity with Hypertrophy of Both Feet. E. H. Crosby. —p. 833.
Acute Osteomyelitis of Cervical Spine with Spinal Cord Pressure: Report of 1 Case with Surgical Cure. W. B. Scoville and R. A. Raskind.—p. 835.

Diseases of Chest, Chicago

9:467-552 (Nov.-Dec.) 1943

*Observations on Tuberculosis in City of Cordoba and Pampa De Achala, Argentina, and Minneapolis, Minnesota. F. Torres, A. Caeiro, J. A. Myers and F. E. Harrington.—p. 467.
Cavernous Hemangioma of Lung: Secondary Polycythemia. A. Goldman.—p. 479.
*Air Embolism in Artificial Pneumothorax: Report of 3 Cases. S. Jacobs.—p. 487.
Intrapleural Pneumonolysis. J. E. Dailey.—p. 492.
Interpleural Communication in Bronchiectasis. F. I. Terrill and K. A. Tyler.—p. 496.
Contagiousness of Tuberculosis: Its Relationship to Compensation Claims. E. Mayer and I. Rappaport.—p. 500.
Lobectomy for Pulmonary Suppuration, Revealing Foreign Body Retained for Twenty-Six Years: Case Report. L. F. Knoepp.—p. 510.
Change in Rate of Circulation and Venous Pressure Following Collapse Therapy in Pulmonary Tuberculosis. O. Feinsilver.—p. 514.

Tuberculosis in Argentina and Minnesota.—Torres and his collaborators made tuberculin tests on six groups of children in the province of Cordoba, Argentina, and on a group of Minneapolis children, 1,288 Argentine children and 2,881 Minneapolis children being tested. Among the Cordoba children the percentage of reactors to tuberculin ranged from 12.7 to 58.6, the average being 51.1. The low percentage of 12.7 was obtained among 71 children ranging from 6 to 15 years of age, who resided in Pampa De Achala, where there is little contact with large centers of population. In the Minneapolis group of 2,881 children 23.1 per cent reacted definitely and 0.6 per cent questionably to tuberculin. Among the 1,288 Cordoba children 741 had x-ray inspection of the chest. The films presented evidence of disease, which was the first infection type of tuberculosis in the pneumonic stage in 6.9 per cent and the reinfection type of pulmonary tuberculosis in 1.7 per cent. In 17.6 per cent, small sharply outlined dense shadows were seen in the pulmonary parenchyma, the hilar region or both. Among the 648 tuberculin reactors in the Minneapolis group the first infection type of tuberculosis in the pneumonic stage was found in 2.3 per cent. On the first examination the reinfection type of pulmonary tuberculosis was found in 0.2 per cent; however, on subsequent examinations this type of disease appeared in 1.1 per cent. Sharply outlined small densities were seen in 21.1 per cent. Apparently the disease has the same characteristics among the children of the two nations. The Pampa De Achala observations are unique. Here is an isolated community of families devoting their lives for the most part to the raising of sheep at an altitude of about 8,000 feet. Of 183 persons tested with tuberculin, the incidence of reactors was only 12.2 per cent among those of 16 to 25 years of age. However, in the older age group the incidence was 65.2 per cent, while the average for all ages was 32.2 per cent. Of the 116 persons in this group who had x-ray film inspection of their chests there was evidence of the first infection type of tuberculosis in the pneumonic stage in 0.8 per cent, but in no one was there any evidence whatever of the reinfection type of tuberculosis. Small dense sharply outlined shadows were present in 22.4 per cent.

Air Embolism in Artificial Pneumothorax.—Jacobs reports 3 nonfatal cases of air embolism in pneumothorax. The mild psychic manifestations, moderately severe sensorimotor symptoms and extremely severe motor type symptoms and signs were similar to those of cerebral lesions. Since these syndromes are due to entrance of air into a pulmonary vein, usually because the pulmonary parenchyma is ruptured by the pneumothorax needle, the use of a meticulous technic is the best safeguard against this complication. The number of fatalities produced is definitely too small to justify curtailment of a collapse therapy program or to justify withholding the benefits of artificial pneumothorax from patients whose pulmonary tuberculosis may conceivably be controlled by it. The 3 reported cases occurred within a period of nine days and constituted the only such pneumothorax accidents in about 2,500 "refills."

Florida Medical Association Journal, Jacksonville

30:221-268 (Dec.) 1943

Foxglove. T. F. Hahn.—p. 235.
Cavernous Sinus Thrombosis with Recovery: Report of Case. H. Fuller.—p. 238.
Acute Left Ventricular Heart Failure: Report of Case in Which One Hundred and Forty-Six Attacks Occurred. J. Seltzer.—p. 240.
Preparation of Scientific Papers. S. Richardson.—p. 241.

Georgia Medical Association Journal, Atlanta

32:353-380 (Nov.) 1943

Surgery of Thyroid. H. M. McKemie.—p. 355.
Some Problems That Should Be Considered by You. J. R. Lewis.—p. 359.
Problem of the Gallbladder: Factors in Surgical Results. R. L. Sanders. —p. 362.
Industrial Hygiene. L. M. Petrie.—p. 368.

Indiana State Medical Assn. Journal, Indianapolis

36:633-736 (Dec.) 1943

War Problems Faced by Medical Profession. H. L. Kretschmer.—p. 633.
Army Medical Laboratory. J. L. Arbogast.—p. 637.
Physicians in the Services and in Civilian Life: Present Status. F. H. Lahey.—p. 638.
The Medical Profession Goes to War. J. Downes.—p. 640.
American Doctor in War. G. F. Lull.—p. 642.
Major Problems of Medical Department of Navy During Present Emergency. D. G. Sutton.—p. 644.
Army Air Forces' Convalescent Rehabilitation Training Program (First Year's Experience). H. A. Rusk.—p. 649.
Battle Casualties, with Special Reference to Use of Sulfonamides. J. F. Luten.—p. 652.
Why Medical Department Gets Job Done. G. A. Owsley.—p. 655.
Anesthesiologist in Army. F. W. Ratcliff.—p. 656.
Rescued Aviation Personnel in South Pacific. R. L. Hane.—p. 657.

Journal Neuropath. and Exper. Neurology, Baltimore

2:315-424 (Oct.) 1943

*Histopathology of Progressive Muscular Dystrophy. G. H. Hassin.—p. 315.
Diffuse Polymorphous Interarachnoidal Meningothelioma. O. Marburg, J. L. Anderson and P. Rezek.—p. 326.
*Histopathologic Changes of Brain Caused by Intracranial Tumors (So-Called Edema or Swelling of Brain). G. E. Perret and J. W. Kernohan.—p. 341.
Solitary Cerebral Gumma. J. G. Sheps.—p. 353.
*Cerebral Aneurysms and Nontraumatic Massive Cerebral Hemorrhage. J. H. Globus and R. S. Globus.—p. 365.
Histopathology of Central Nervous Tissue in Experimental Vitamin K Deficiency (Vitamin K Deficiency Hemorrhagic Diathesis). A. Ferraro and L. Roizin.—p. 392.
Combined Myelin and Fat Stain: Technical Note. B. Kahn.—p. 411.

Histopathology of Progressive Muscular Dystrophy.—Hassin reports observations in several cases of muscular dystrophy. In 1 case the material was obtained post mortem, while in 3 biopsy was performed. In progressive muscular dystrophy definite changes occur in the muscles which may be termed idiopathic, that is independent of the condition of the spinal cord or the peripheral nerves. The alterations are in the form of atrophies, hypertrophies, loss of striations, myofibrillary disruption, obliteration of Cohnheim's fields, hyalinization and fatty metamorphosis (lipomatosis), all resulting in formation of a connective tissue scar (fibrosis). Fibrosis is represented by numerous microscopic connective tissue scars diffusely scattered in the muscles and resembling a similar process in multiple sclerosis where the scars are glial. The scar formation is in some instances preceded by phenomena of myophagia, in analogy to those of satellitosis and neuronophagia, which are so characteristic of degenerative conditions of the central nervous system (multiple sclerosis). The scars render the muscle changes irreversible, which is also in analogy to what is seen in multiple sclerosis and other degenerative conditions of the central nervous system. For investigation of pathologic changes, muscles obtained at necropsy have certain advantages and should be used whenever possible in preference to material obtained for biopsy.

Changes of Brain Caused by Intracranial Tumors.—Perret and Kernohan point out that each intracranial space occupying lesion brings about changes in the surrounding portion of the brain, and these changes in turn produce various neurologic symptoms. The most important change is an increase in the volume of the brain which gives rise to increased intracranial pressure. Such pressure is partly the result of the tumor itself and partly the result of surrounding edema. The reactions of the brain tissue to space occupying lesions, and especially tumors, are numerous and variable, affecting the various cellular elements in the brain. The authors present studies on 37 brains containing various types of neoplasms, and on 2 cases of abscess, 1 case of subdural hematoma and 1 case of generalized edema of unknown origin. The brains were removed after they had been injected with 10 per cent solution of formaldehyde through the carotid arteries from fifteen to sixty minutes after death. They were obtained from the cadavers of some patients who had undergone craniotomy and from the cadavers of others who had died without undergoing an operation. The authors also studied fresh tissue in the form of 93 specimens removed for biopsy in the course of an operation. Edema of the brain is nonspecific and is associated with all types of tumors of the cerebral hemispheres, the cerebellum and the brain stem; it is more generalized in the presence of intracerebral tumors, and especially the more malignant and rapidly growing gliomas. Increased intracranial pressure is the direct result of the edema which may remain local around the tumor or may be confined to one cerebral hemisphere or occasionally may be generalized in the whole brain. The edema is not specific for brain tumors. Edema is more prominent in the white matter than in the cortex and is characterized by a loosening of the ground substance, enlarged perivascular and pericellular spaces, swelling and proliferation of the astrocytes and oligodendroglia, and various types of degeneration of the nerve cells. The degenerated nerve cells become surrounded by numerous proliferated, swollen oligodendrocytes, which later frequently occupy the place left by the disintegration of the nerve cells. The edema is thought to be caused by direct damage to the brain by the tumor, which with the production of circulatory disturbances leads to anoxia and acidosis of the brain tissue and the absorption of toxic products from necrotic tumor tissue.

Cerebral Aneurysm and Massive Nontraumatic Cerebral Hemorrhage.—Ten cases of ruptured cerebral aneurysm with consequent intracerebral and fatal intraventricular hemorrhage are reviewed. The cases demonstrate that softening of brain tissue results from an aneurysm of a neighboring cerebral blood vessel and concomitant alterations in its branches. This condition initiates changes in the brain tissue paralleling the progressive disease alterations in the aneurysmal wall which culminates in rupture of the aneurysm. The escaping blood finds its way into the neighboring previously softened brain tissue. Thence the blood, still under the influence of arterial pressure, breaks through a residual zone of partially softened tissue separating the so-called hemorrhagic cavity from the adjoining compartment of ventricular cavities and floods the latter as the fatal termination. This is a discouraging feature of cerebral aneurysm, one which received little recognition and which is responsible for many a surprising fatal termination. A fatal issue occurred as the result of intracerebral and intraventricular hemorrhage in 10 out of 20 cases of verified cerebral aneurysm. Surgical intervention in cerebral aneurysm is a hazardous undertaking. Encephalomalacia in the proximity of an aneurysm is most commonly encountered in relation to vessels constituting the rostral part of the circle of Willis. This explains the absence of symptoms, at least in the early phase, such as would point to the existence of brain softening preceding the intracerebral and intraventricular hemorrhage. Hypertension and cerebral arteriosclerosis are exceptional findings in cerebral aneurysm which has existed long enough to cause softening of brain tissue, rupture and flood with blood the softened brain tissue adjoining the affected vessel. It suggests that in the majority of instances the aneurysm is congenital in origin and not acquired as the result of arteriosclerosis or hypertension. Results of an experiment indicate that the tensile strength of brain tissue is a determining factor in intracerebral hemorrhages. The tensile strength of the brain tissue is appreciably higher than the intracranial pressure. Syphilis seems to play an insignificant role in the development of aneurysms. Previous attacks of subarachnoid hemorrhage may be regarded as clues to implication of brain tissue by aneurysm. Focal signs, in spite of disintegration of brain tissue, are rare. One fairly constant finding is the inequality of pupils, with the larger pupil on the side of the hemorrhagic lesion.

Journal of Pediatrics, St. Louis

23:497-630 (Nov.) 1943

Electroencephalographic Response to Overventilation and Its Relation to Age. F. A. Gibbs, Erna L. Gibbs and W. G. Lennox.—p. 497.
Nutrition Studies During Pregnancy: IV. Relation of Protein Content of Mother's Diet During Pregnancy to Birth Length, Birth Weight and Condition of Infant at Birth. Bertha S. Burke, Vernette Vickers Harding and H. C. Stuart.—p. 506.
*Observations on Tetanus Immunization: The Dosage of Alum Precipitated Toxoid and Use of Fluid Toxoid After Trauma. J. J. Miller Jr. and J. B. Humber.—p. 516.
Liver Function in Newborn Infant. G. W. Salmon and Ellen Ehrenfest Richman.—p. 522.
*Roentgen Therapy of Interstitial Pneumonia. A. Oppenheimer.—p. 534.
Breath Holding Spells: Their Relationship to Syncope, Convulsions and Other Phenomena. E. M. Bridge, S. Livingston and C. Tietze.—p. 539.
Concurrent Meningococcal Meningitis and Salmonella Bacteremia. E. R. Neter.—p. 562.
Jejunal Intussusception: Report of Case in Six Day Old Infant. E. P. Scott.—p. 565.
An "Improved" Consultant's Case for Pediatric Physicians. R. A. Wilson.—p. 568.

Tetanus Immunization.—Miller and Humber compared the tetanus antitoxin titers attained in two groups of children. In the first group 68 children received two injections of 1 cc. each of combined alum precipitated diphtheria and tetanus toxoid at a minimum interval of eight weeks, followed by a third injection of 0.5 cc. of alum precipitated tetanus toxoid at a minimum of sixteen weeks later. In the second group 93 children received the first two injections but not the third. Between three and six months after completion of the injections, 13 of 26 children

in the "three injection" group had levels of 1.0 unit or more, whereas only 3 of 28 children tested in the "two injection" group exhibited similar levels. Furthermore, the levels of 3 children in the latter group had dropped below 0.1 unit. Between nine and fifteen months after completion of the injections the principal difference in the two groups was the proportion above and below the 0.1 unit level. This difference greatly favored the group which had three injections. There was also an opportunity to compare the speed of antitoxin production following alum precipitated and fluid toxoid reinjection. The authors conclude that three injections of alum precipitated tetanus toxoid at three monthly intervals initiate and maintain for one year antitoxin titers between 0.1 and 1.0 unit. This level is probably protective even if reinjection is impossible or is omitted at the time of trauma. A basic course of three injections and annual reinjection with alum precipitated toxoid are recommended for children. When laceration occurs in an individual previously injected with either alum precipitated or fluid tetanus toxoid, a stimulating reinjection with fluid tetanus toxoid is to be preferred to one with alum precipitated toxoid because the rise in antitoxin is more rapid.

Roentgen Therapy of Interstitial Pneumonia.—Oppenheimer resorted to roentgen treatment in 36 children with interstitial pneumonia. The diagnosis was based on the presence of fever, cough and dyspnea associated with infiltration along and around the bronchi and bronchioles shown on roentgenograms, with absence of lobar and bronchopneumonic consolidations, and failure of the symptoms to respond to sulfonamide medication. As soon as the diagnosis was established, the patient was given one roentgen treatment. The dosage was determined by the age of the patient and the duration of the disease. The more recent the illness, the smaller the roentgen dosage, 45 to 55 roentgens being given to children about 2 years old, 25 roentgens to babies under 4 months and up to 60 roentgens to children over 5 years. The treatment was repeated with slightly larger doses (about 10 roentgens more) after twenty-four hours if fever, dyspnea and cyanosis had not subsided by that time. With small doses of roentgen rays rapid and consistent improvement of the clinical condition took place in 33 of 36 patients with interstitial pneumonia. Treatment with doses exceeding 100 roentgens during acute stages resulted in severe constitutional reactions.

Medical Annals of District of Columbia, Washington

12:417-454 (Nov.) 1943

Meningococcal Carrier State. E. B. Schoenbach.—p. 417.
Malaria: Its Control and Treatment. O. J. Brown and E. M. Bingham.—p. 421.
Pandemic Influenza. T. Parran.—p. 425.
Causes of Persistent Fever Encountered in Sulfonamide Therapy of Pneumonia. J. G. M. Bullowa and A. O. Tumen.—p. 428.
Ergot in Delayed Postpartum Bleeding: Preliminary Report. D. Deutschmann.—p. 434.

Minnesota Medicine, St. Paul

26:1039-1118 (Dec.) 1943

Feeding the Child. R. E. Nutting.—p. 1039.
Preparing Child for School. J. Baker.—p. 1041.
Emotional Disturbances of Children in Wartime. H. F. Helmholz.—p. 1044.
Carcinoma of Lung. H. J. Moersch and W. S. Tinney.—p. 1046.
Use of Curare in Metrazol Treatment of Psychoses. E. W. Miller.—p. 1052.
Discovery of Pulmonary Circulation of Blood. M. Neuburger.—p. 1054.
Plasma and Serum Toxicity Due to A and B Substances. M. G. Levine and D. State.—p. 1056.
Problems Encountered in Explaining Certain Cases of Erythroblastosis Fetalis on Rh Theory. A. J. Hertzog.—p. 1057.
Successful Treatment of Extreme Allergy to Bee Body and Bee Venom. E. G. McLane.—p. 1061.
Common Duct Repair by Means of Vitallium Tube. J. M. Hayes.—p. 1064.
Reinfection with Pneumococcus Meningitis. H. I. Arbeiter and M. G. Levine.—p. 1065.

New Jersey Medical Society Journal, Trenton

40:413-452 (Nov.) 1943

Factors in Peripheral Lesions Following Carbon Monoxide Poisoning. E. A. Seifert.—p. 418.
Tuberculosis Screening Examinations of Industrial Workers. M. H. Collier and W. H. MacDonald.—p. 421.

Ohio State Medical Journal, Columbus

39:1089-1180 (Dec.) 1943

Blood Chemistry and General Practitioner. R. G. Lehman.—p. 1103.
Senile Psychoses and Psychoses with Cerebral Arteriosclerosis. J. J. Alpers.—p. 1108.
Recent Advances in Clinical Ophthalmology. J. E. L. Keyes.—p. 1110.
*Effects of Pyridoxine on Nausea and Vomiting of Pregnancy: Results of Treatment of 40 Patients. W. M. Silbernagel and O. P. Burt.—p. 1113.
Malignant Disease of Peritoneum. O. Berghausen.—p. 1115.
Vitamin K in Tonsillectomy Granulation Oozing. C. A. Campbell.—p. 1116.
Congenital Absence of Vagina. P. J. Reel.—p. 1117.
Urticaria and Angioneurotic Edema: Summary of Our Present Knowledge. M. B. Cohen.—p. 1120.
Silicosis. J. H. Skavlem.—p. 1123.
Heart Disease Secondary to Syphilitic Aortitis. R. H. Fuller and H. W. Ryder.—p. 1126.
Meeker Day on Midwifery. P. D. Jordan.—p. 1133.

Pyridoxine in Vomiting of Pregnancy.—Silbernagel and Burt used pyridoxine hydrochloride in the treatment of 40 patients with nausea and vomiting of pregnancy. Complete relief was obtained in 38 of 40 patients treated with intravenous injections. Ill effects were not noted. No other treatment was employed. All patients improved in six to twenty-four hours after the initial injection. The duration of the improvement was variable. Six patients with accompanying seborrheic skin lesions were greatly improved. It is suggested that nausea and vomiting of pregnancy may be due to hepatic glycogen deficiency, which may be caused by faulty fat metabolism. Pyridoxine hydrochloride may work through its corrective action on deranged fat metabolism.

Oklahoma State Medical Assn. Jour., Oklahoma City

36:461-506 (Nov.) 1943

Some Clinical Observations on Coronary Sclerosis. W. Langston.—p. 461.
Interrelationship of Solid, Liquid and Gas Metabolism. E. G. Mason.—p. 467.
Control of Syphilis in Oklahoma Industry. D. V. Hudson.—p. 471.
County Health Department in Oklahoma. J. W. Shackelford.—p. 475.

Pennsylvania Medical Journal, Harrisburg

47:97-192 (Nov.) 1943

Pennsylvania Emergency Maternity and Infant Care Program. P. Dodds.—p. 115.
Surgical Treatment of Bronchiectasis. H. A. Kipp.—p. 117.
Common Errors in Gynecologic Diagnosis. F. B. Nugent.—p. 124.
Aspects of Gallbladder Surgery. C. B. Rentschler.—p. 131.
Fat Meal—Its Value in Cholecystography. R. D. Bacon.—p. 137.

Southern Medical Journal, Birmingham, Ala.

36:709-780 (Nov.) 1943

*Prothrombin Determinations in Acute Coronary Occlusions. H. M. Doles.—p. 709.
Trails and Trends in Abdominal Surgery. R. L. Sanders.—p. 714.
Sulfacetamide and Sulfadiazine Therapy in Urinary Tract Infections. E. P. Alyea and A. A. Parrish.—p. 719.
Kidney Operations in Renal Calculus. M. L. Boyd.—p. 723.
Relation of Conjoint Tendon to Permanent Cure of Inguinal Hernia. C. R. Robins.—p. 731.
Duplication of Terminal Ileum: Report of Case Associated with Two Congenital Diverticula. E. W. Grove and L. D. Porch.—p. 735.
Postabortal Tetanus: Successful Treatment with Dihydro-Beta-Erythroidine. E. G. Goodman and J. F. Reinhardt.—p. 737.
*Pellagra, Pernicious Anemia and Sprue: Allied Nutritional Diseases. S. Harris and S. Harris Jr.—p. 739.
*Peptic Ulcer Treated with Aid of Posterior Pituitary Extract. M. H. Metz and R. W. Lackey.—p. 747.

Prothrombin Determinations in Acute Coronary Occlusions.—Doles demonstrated that the prothrombin time is well below normal during an attack of coronary occlusion. Prothrombin determinations were carried out on all patients at the time of their first examination. One or more determinations have been made on 457 persons. Eight patients of this group developed acute coronary occlusion while under observation; 5 were not seen until after the occlusion had occurred. Prothrombin was determined in 13 patients before, during and after an acute occlusion. The occlusion did not occur in any of these patients until the prothrombin time was below 70 per cent of normal. Since a search of literature failed to show any instance of vitamin K being used in acute coronary occlusion, the use of this therapy was carried out with considerable care. In addition to close observations of these patients

for any unsatisfactory effect on the circulatory system, prothrombin determinations were made daily during the first fourteen days, twice a week until the end of the sixth week, and once a month after discharge from the hospital until the patient's vitamin K requirements were determined. It has also been a routine to make prothrombin determinations once every six weeks as long as the patient is under observation. Small amounts of vitamin K were given in the early stages, but as no harmful results were observed and more patients were investigated the doses both in amounts and frequency were increased. Of the patients whose prothrombin time was restored to normal limits shortly after the acute onset the convalescence was less stormy and the amount of myocardial damage resulting from the occlusion appeared to be considerably less. Although these observations suggest that vitamin K deficiency is a factor in the mechanism of acute coronary occlusion, this series is too small to permit definite conclusions to be drawn.

Pellagra, Pernicious Anemia and Sprue, Allied Nutritional Diseases.—The Harrises maintain that pernicious anemia, pellagra and sprue are three separate and distinct disease entities; but there are many reasons for concluding that they are allied nutritional diseases. The oral and gastrointestinal symptoms in pellagra without skin lesions, pernicious anemia and sprue may be indistinguishable one from the other in cases in which there is macrocytic anemia. The most effective treatment in pellagra, pernicious anemia and sprue is liver and liver extracts. Nicotinic acid is an ingredient of liver and liver extract. Liver changes, usually fatty degeneration, is an almost constant occurrence in pellagra and pernicious anemia and to a less extent in sprue. Atrophy of the stomach and intestine may be found in all three diseases. If cord changes are found in pellagra, pernicious anemia or sprue, the lateral and posterior columns are involved. Liver insufficiency appears to be a factor in the genesis of pellagra, pernicious anemia and sprue. Cases are reported in which pellagra and pernicious anemia, pellagra, sprue and pernicious anemia existed in the same patients. This fact suggests common etiologic factors. The frequency of intestinal parasites in anemic patients with pellagra, pernicious anemia or sprue is mentioned with the suggestion that intestinal toxemia and liver insufficiency may be etiologic factors in some cases. The occurrence of pellagra in alcoholic addicts and the not infrequent complication of pernicious anemia in cirrhosis of the liver suggest that pathologic changes in the liver and/or liver insufficiency may be factors in alcoholic pellagra and pernicious anemia in patients with liver cirrhosis.

Posterior Pituitary in Peptic Ulcer.—Metz and Lackey say that the idea that posterior pituitary might influence the healing of an ulcer presented itself when a few patients with the ulcer syndrome exhibited completely unexplained polyurias. The ulcer syndrome associated with an abnormality of water metabolism has been greatly benefited by posterior pituitary in the majority of cases, but polyuria is not a prerequisite for employing the substance. Experiments were carried out with both human beings and animals. These concerned three functional changes observed in this disease: gastric hypersecretion, gastric and duodenal hypermotility and hyperemia of the gastric mucosa. These alterations were seen to revert toward normal under the influence of posterior pituitary in a much more satisfactory manner than in patients who had only medical management. Nocturnal fasting gastric secretion and hypermotility were especially reduced. The diet consisted of only three meals daily with milk once between meals and at bedtime. The diet would satisfy all protein, mineral and vitamin requirements and it omitted only the obvious irritants and most indigestible foods, as fried ones, coarse vegetables and pastries. Along with posterior pituitary the patients were given an effective antacid and also an antispasmodic drug for about the first two weeks of care. Satisfactory clinical results are reported in 311 cases, or 74 per cent of the entire series of 418 unselected cases of peptic ulcer treated with the aid of posterior pituitary. Intranasal insufflation of desiccated posterior pituitary powder has proved to be the most dependable means of administration. It is emphasized that this hormone should be considered as a supplement to the rational medical management of patients with uncomplicated peptic ulcer.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

18:113-160 (Sept.) 1943

Some Recent Virus Work and Its Practical Import. S. P. Bedson.—p. 113.
Studies in Anemias of Infancy and Early Childhood: Part XIV. Fate of Transfused Erythrocytes. H. S. Baar and T. W. Lloyd.—p. 124.
*Head Injuries in Children and Their After-Effects. E. Guttmann and H. Horder.—p. 139.
Fibrinogen Deficiency as Factor in Hemorrhagic Disease. E. C. Allibone and H. S. Baar.—p. 146.

Head Injuries in Children.—Guttmann and Horder show that children form a considerable proportion of admissions to an accident service. Observations on 60 children with head injuries indicates that the incidence of these injuries was higher in summer than in winter. Boys were more numerous than girls. Two thirds of the cases were due to road accidents. The intelligence of the children was average and did not indicate their accident liability. Fractures of the skull were more frequent than among adults. In the acute stage emotional symptoms were more impressive than clouded consciousness and intellectual loss. The incidence of headache did not differ much from that in adults. Two thirds of the patients were fit for discharge after two weeks' treatment in the hospital. The absence from school due to the accidents was two to seven weeks in half of the cases, less in one fourth and more in one fourth. The postconcussional syndrome was observed in 10 per cent of the cases; its incidence depended to a large extent on environmental factors. Irritability was the most common aftereffect. Persistent behavior disorder was rare, as also was intellectual impairment.

Lancet, London

2:593-624 (Nov. 13) 1943

Orthopedic Influence on Treatment of Fractures: Clinical Study. G. R. Girdlestone.—p. 593.
*Effect of Altitude on Cases of Pneumothorax. G. S. Todd, with comments on electrocardiograms by D. M. Anderson.—p. 597.
Delayed Tuberculin Reaction. M. Daniels.—p. 600.
*Effects of Accidental Exposure to Mustard Gas Vapor. R. S. Aitken.—p. 602.
Retrograde Amnesia: Some Experiments. W. Mayer-Gross.—p. 603.
Resection of Small Intestine in Infant Three Weeks Old. K. J. Adams.—p. 605.
*Perforation of Rectum from Immersion Blast. P. G. C. Martin.—p. 605.

Effect of Altitude on Pneumothorax.—Todd and Anderson studied the effects of altitude on pneumothorax in the low pressure chamber. The subjects studied were 2 patients with rightsided pneumothorax, 1 of whom had a mobile and the other a partially fixed mediastinum; 2 patients with leftsided pneumothorax, 1 with a mobile and the other with a partially fixed mediastinum, and 1 patient with a rightsided pneumothorax, who had a bronchopleural fistula. X-ray examination on inspiration and expiration was carried out at different altitudes. Readings of vital capacity and analyses of samples of alveolar air were done on some and electrocardiograms were taken of 4 of the patients at different elevations. The authors conclude that, if possible, no patient with a wound of the chest causing pneumothorax should go above 4,000 feet if transported by air. If it is necessary to go to greater heights the pressure should be adjusted by removing as much air as possible before the start of the journey. In cases of tension pneumothorax due to escape of air through a lacerated lung it will be necessary to place a needle or an intercostal catheter in position in order to control the pressures during the flight. Pilots or passengers with an artificial pneumothorax should not fly by airplane at the most above 6,000 feet for any length of time and should on no account go above 8,000 feet. Those with a mobile mediastinum appear to stand altitude better than those with adhesions or a fixed mediastinum, in whom there is always danger of rupture of an adhesion. By removing most of the air before the ascent it is possible to allow the patient to fly higher; but expansion of a lung collapsed by artificial pneumothorax is likely to exacerbate the underlying disease. If a patient with artificial pneumothorax must undertake a flight up to 8,000 or 10,000 feet he should go just before a refill is due and not immediately after one.

Accidental Exposure to Mustard Gas Vapor.—Aitken reports observations on a number of soldiers who were accidentally exposed to an unknown dose of mustard gas vapor in their sleeping quarters. After from five to six hours of continuous exposure many men wakened with symptoms. They complained of painful watering eyes, photophobia and dimness of vision; some could not open their eyes. They had moderate to severe headache, mostly frontal, which lasted several hours or longer. They vomited, often repeatedly, for an hour or two and were dizzy. Their throats felt dry or, in a few cases slightly sore, and some of them felt constriction in their chests; they coughed. Castor oil drops were placed in their eyes. They were stripped, washed and transported to hospitals. Bright red erythema was present on faces and necks, the parts unprotected by clothing, sleeping bags or hair. Only in 1 case did vesicles appear. The erythema quickly faded, disappearing in three to six days and leaving neither discoloration nor desquamation. Discomfort in the eyes varied. The lids were edematous and red; some men were unable to open them on account of swelling. Those who could open their eyes had photophobia and dimness of vision. The conjunctivas were injected and the flow of tears was profuse. On admission 3 drops of 2.5 per cent sulfacetamide ("Albucid") solution was placed in every conjunctival sac. This was repeated two and four hours later. Thereafter for four days 2.5 per cent sulfacetamide ointment was applied between the lids twice daily, and for ten days the pupils were kept dilated with atropine. During the first two days swollen eyelids in close apposition were gently separated every hour or two to facilitate the escape of tears. Sulfadiazine was given for four days to persons showing rises of temperature, and sedatives for nocturnal cough. All the men, with the possible exception of 2, could have been regarded under active service conditions as fit for duty by the tenth day. No secondary infection developed in conjunctivas or lungs.

Perforation of Rectum from Immersion Blast.—Martin reports the case of a seaman who was thrown into water when a cruiser was torpedoed. A depth charge exploded near him. On admission to the hospital fourteen hours after the torpedoing the patient showed no external signs of wounding. He was complaining of severe lower abdominal pain, worst in the right iliac fossa. He was passing a small amount of bright red blood from the anus. The abdomen was rigid all over, more especially in the right iliac fossa. A laparotomy was performed, and pus was seen in the peritoneal cavity. The first part of the rectum on its anterior surface showed a lacerated bruised perforation about 1 cm. in diameter. The perforation was oversewn and buried with a purse-string suture. The abdominal contents were rapidly searched for any further injuries, but none were found. A pelvic colostomy with a long spur was made. The pelvis was drained and the abdomen closed. A blood transfusion was given. On the third day paralytic ileus became evident. Duodenal drainage, intravenous drip and small repeated doses of morphine were of no avail, and the man died fifty-two hours after operation. Necropsy revealed general peritonitis.

Archiv für Kinderheilkunde, Stuttgart

126:161-208 (Aug. 28) 1942. **Partial Index**

Surgical Treatment of Renal Tumors During Childhood. W. Schaffer.—p. 161.
Sympathogonioma in a Newborn Infant. Olga Brauner.—p. 174.
Eosinophilia in Scarlet Fever with Particular Attention to Eosinophilia of Skin. K. Demel.—p. 177.
*Treatment of Pleural Empyema in Childhood. Karoline Valentin.—p. 190.
*Intrauterine Transmission of Measles: 2 Cases. K. Hofer—p. 194.
Pneumonia in Prematurely Born Infants. H. Muralter.—p. 198.

Treatment of Pleural Empyema of Childhood.—In addition to surgical treatment and chemotherapy, blood transfusions are valuable for pleural empyema. Valentin reviews observations on 159 children with pleural empyema. Thirty-six of these were infants less than 1 year of age, 67 were between 1 and 3 years old and the remaining 56 were over 3 years of age. A comparison of the recovery and death rates of the 53 who received blood transfusion with the 106 who did not discloses that in the 53 treated with transfusion the death rate was 22.6 per cent, whereas in the 106 without transfusion it was 39.6 per cent. The efficacy of transfusion was particularly noticeable during the first two years of life.

Intrauterine Transmission of Measles.—Hofer reports 2 cases of intrauterine transmission of measles. In the first case the transmission must have taken place during the preexanthematic stage, because the mother developed the measles rash during birth, while the infant developed the rash on the eighth day of life. In the second instance the mother exhibited the rash on the third day after delivery and the infant on the tenth day of life. The first child was treated with maternal blood, the second with convalescent serum. The course was short and mild in both cases, and there were no complications.

Archiv für klinische Chirurgie, Berlin

203:343-530 (Aug. 20) 1942. **Partial Index**

Bleeding Ulcers of Stomach and of Upper Intestine. H. Gotenbruck.—p. 343.
*Development of Gastric Carcinoma from Gastritis and Inflamed Polyps? H. Westhues.—p. 391.
Surgical Significance of Misplacement of Colon Between Liver and Diaphragm. R. Felkel.—p. 436.
*Treatment of Exophthalmic Goiter and of Toxic Goiter. L. Rathcke.—p. 449.
Treatment of Open Pneumothorax. K. Kuhlmann.—p. 468.
Familial Occurrence of Bilateral Renal Calculi. L. G. Vogt.—p. 474.
Lesions of Acetabulum During Childhood. Z. Mester.—p. 486.

Development of Gastric Carcinoma from Gastritis and Polyps.—Konjetzny believes that approximately 85 per cent of all gastric cancers develop on the basis of gastritic mucosal changes. Westhues, on the basis of 463 resected stomachs and 40 stomachs obtained by necropsy, concludes that inflammation is not the decisive factor in the development of gastric cancer. The blastomatous gastric polyps, which are definitely precancerous in nature, are likewise not of inflammatory nature, and cancers developing from them are not the result of inflammation. He does not deny the possibility of development of cancer on the basis of gastritis. His view differs from that of Konjetzny more quantitatively than qualitatively. However, this difference plays a decisive role in treatment because, if Konjetzny's views are correct, preventive resection would be justified in gastritis. If, however, cancer develops only in exceptional cases on the basis of a gastritis, preventive resection is not indicated. Konjetzny himself is very moderate in his demand for preventive resection. His therapeutic views contradict his theoretical reasoning to a certain extent. The greater incidence of gastritis in recent years has not increased the incidence of gastric cancer. Prophylaxis is still mainly a question of early diagnosis and prompt treatment of the gastric cancer.

Exophthalmic and Toxic Goiter.—Rathcke designates as toxic those forms of goiter which on microscopic examination do not show epithelial proliferation and liquefaction of colloid but which show transitional microscopic changes. Exophthalmos and other ocular signs are absent, but other symptoms, such as motor unrest, acceleration of the pulse rate, loss of weight and considerable increase in the basal metabolic rate, are present. A patient's general condition is of greater importance for the determination of the optimal time for operation than the basal metabolic rate. The thymus plays a decisive part in the development of coma. The thyroid and the thymus have an antagonistic or compensatory function. When the thyroid is removed there is no longer the inhibitory action on the thymus. Medical treatment is justified in exophthalmic goiter. When rest and forced feeding prove ineffective, the patient should be referred to a surgeon. Roentgen therapy is not always effective and may make the later operation more difficult. Damage to the parathyroids has been observed after irradiation. This report is based on 97 patients with exophthalmic or toxic goiters. The mortality rate of 19 per cent is high, but some patients were already in coma when they arrived at the surgical clinic. Fourteen of the 19 patients who died had thymus involvement. Two stage operations were tried, but a comparison of the results reveals no advantage over the one stage operation. Adequate preoperative treatment is of the greatest importance. Surgical treatment consists in bilateral resection of the thyroid. Iodine medication, if necessary by the intravenous route, is resumed immediately after operation. Dextrose infusions are given to counteract the harmful effect of the thymus on the cardiac and hepatic glycogen. They also influence the elimination of toxic substances. For threatened coma a transfusion is given immediately after the operation.

Book Notices

Human Gastric Function: An Experimental Study of a Man and His Stomach. By Stewart Wolf, M.D., Captain, M. C., A. U. S., and Harold G. Wolff, M.D., Associate Professor of Medicine, Cornell University Medical College, New York. With a foreword by Walter B. Cannon, M.D. Cloth. Price, $4.75. Pp. 195, with 42 illustrations. New York, London, Toronto: Oxford University Press, 1943.

Two Beaumonts found another Alexis St. Martin, and this is the report of their studies. It is an immensely more readable, interesting and useful book than the "Experiments and Observations" of 1833, but then, few men are so gifted as to see more than they have been prepared to see by the training they have gotten from books, teachers and contemporary writings. Beaumont was interested most in how digestion took place: in how the stomach contracted, and in the composition of the gastric juice. Wolf and Wolff, living in an age when physicians are much interested in the causes of ulcer, in psychosomatic medicine and in gastritis as seen through a flexible gastroscope, were much interested in the ulcer which they were able to produce and later to heal, in the changes in the appearance of the gastric mucosa which were associated with emotional storms, in the great increase in gastric acidity which came whenever their temperamental Irishman became worried, annoyed or outraged and in the changes resembling those of hypertrophic "gastritis," which sometimes came and went within a time interval of minutes.

The book is full of thought provoking material, and any internist who hopes to stay well educated cannot afford to pass it by. Probably no other work throws so much light on the factors which cause an ulcer to flare up and become active or painful or intractable. All psychologists and all intelligent laymen can find much of interest in the remarkable story told by Wolf and Wolff. If their book had been written a hundred years ago, when research was rare and facilities for carrying it out few, it would certainly have gone down in history as one of the greatest of medical classics. Perhaps even today, when good research is being done in scores of laboratories, the excellence and significance of this little book will be widely recognized and never forgotten.

Synopsis of Tropical Medicine. By Sir Philip Manson-Bahr, C.M.G., D.S.O., M.D., Senior Physician to the Hospital for Tropical Diseases, Royal Albert Dock and Tilbury Hospitals. Cloth. Price, $2.50. Pp. 224, with 5 illustrations. Baltimore: Williams & Wilkins Company, 1943.

As the name implies, this is essentially a condensation of the author's well known textbook on tropical diseases. The material is compressed into a small volume and contains an immense amount of information. It is inevitable that a book of this character, in which all discussion is eliminated, will contain statements with which other authorities disagree. It is likewise inevitable that certain inaccuracies should be present. Generally speaking, the author has accomplished very successfully the objectives set forth in the preface, to provide a guide to tropical medicine in a condensed form suitable for medical officers in the armed forces.

In the discussion of malaria the statement that the sporozoites enter erythrocytes is not established, and the statement that Anopheles gambiae has exended far into Brazil is not in keeping with the recent report of the elimination of this vector. He fails to include Anopheles quadrimaculatus as a vector in the United States and does include it in the Caribbean area, where it is not existent. The use of the term "trypanosome chancre" in the discussion of African sleeping sickness is not a happy one. The section on the diagnosis of intestinal amebiasis leaves the reader with the impression that ulcers are usually visible on sigmoidoscopy of all cases, and the statement that Endamoeba histolytica may become emetine fast is not proved nor, in fact, is there any convincing evidence that this may occur. The high opinion of emetine bismuth iodide as a therapeutic agent is not shared by clinicians in this country who are familiar with the extreme intolerance of patients of this preparation.

The statement that the relapsing fevers in North America are louse borne is incorrect, as is likewise the statement that plague is endemic in the southern part of the United States. The discussion of brucellosis omits the extremely important chronic form so commonly attended by severe and long drawn out physical disability and neurasthenia. Experience in the United States, moreover, has not indicated that any of the sulfonamides are of value in treatment. In the description of cholera it is said that the vibrios may be recovered from the blood, kidneys and spleen. This is in contradiction with all authorities, who are uniform in the statement that the organism is never encountered in the blood or tissues. Nicotinic acid is said to be specific for the treatment of sprue without mention of the value of unrefined liver extract. This is a serious omission. In the consideration of the geographic distribution of Schistosoma mansoni it is not listed as occurring in Puerto Rico. Despite these discrepancies and others of similar types, there is no doubt that this volume constitutes an excellent attempt to meet a real need. It is far and away the best publication of its type.

Oral Diagnosis with Suggestions for Treatment. By Kurt H. Thoma, D.M.D., Professor of Oral Surgery and Brackett Professor of Oral Pathology, Harvard University, Boston, with contributions by Fred Trevor, D.M.D., Instructor in Oral Pathology, Harvard Dental School, Henry Goldman, D.M.D., Instructor in Oral Pathology, Harvard School of Dental Medicine, and David Welsberger, D.M.D., Associate in Clinical Dentistry, Harvard School of Dental Medicine. Second edition. Cloth. Price, $6.75. Pp. 495, with 666 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

This is a complete revision of Oral Diagnosis and Treatment Planning, as the latter title was misleading and misunderstood by those not in contact with new developments in dental education. The arrangement of material in this book facilitates diagnosis, but the practitioner is equally concerned with treatment, especially new ideas and methods. Thus an attempt has been made at the end of each chapter to outline some of the prevailing methods of treatment especially for those diseases not frequently seen or for which new remedies have been suggested. General health is analyzed for cooperation between dentist and physician. In part I special methods of examination are discussed and treatment planning from a broad point of view only. Part II deals with the special diagnosis of dental and oral diseases and suggests treatment procedures. Classification has been arranged from an anatomic point of view, with subdivisions based on the most evident symptoms rather than etiologic factors. This should lead the diagnostician from the obvious to the more obscure changes, from many possibilities to a small number, from the conditions visible to the eye to those discoverable only by the process of differentiation and elimination, should envisage significant possibilities and should put diagnosis on a sound basis. Examination should not be restricted to the complaint needing immediate attention. A complete checking of the teeth, jaws and oral structures represents a real health service. The effect of certain general disorders on the outcome of the treatment of dental and oral diseases must be considered to a greater extent than heretofore. Metabolic disturbances, blood dyscrasias and infectious diseases should be considered, when present, in planning treatment. If the general practitioner is not prepared to undertake extensive investigation, it is his duty to recommend the services of a consultant for diagnosis or treatment or both. This is an excellent book and should be close to the student and graduate alike at all times.

A Hundred Years of Medicine. By C. D. Haagensen and Wyndham E. B. Lloyd. Cloth. Price, $3.75. Pp. 443. New York: Sheridan House, Inc., 1943.

This book is designed primarily for the layman, and for students of medicine and practitioners who have not found time for an extensive study of the history of medicine.

Some knowledge of the course of political history is essential to our evaluation of contemporary events, and this is equally true in medicine. Well intentioned proposals and theories in medicine are frequently recognizable as unsound when viewed against the historical background of their special subjects, and the importance of a historical point of view for the layman as well as for the medical student is emphasized by each increase in the complexity of the medical curriculum and practice. It may also be observed that medical history is inextricably conditioned by political and economic history. Many of our current problems of medical economics are not primarily medical but are part of the changing economics of our times.

Haagensen and Lloyd present a short review of the principal events in medicine grouped under topics such as the germ

theory, orthopedics, thoracic surgery, surgical shock, tuberculosis and pernicious anemia, to mention a few at random. In part I the development of medicine up to a century ago is summarized as a background of contrast for part II, which reviews under selected topics the progress and growth of medical knowledge. In part III the progress of surgery is similarly described.

The new social aspects of medicine are outlined in part IV. The central problem is "how best to utilize our vast armamentarium of medical knowledge for the benefit of society. . . . In forming an opinion on this complex question, the reader should keep in mind that physicians as a class are as idealistic today as they were in our grandfathers' time, and that there are a great many of them who would welcome any practical plan for improving the organization of medical care. Unfortunately, the problem is not an easy one." And, it might be added, the problem cannot be solved by the socialization of medicine with its resultant decrease in efficiency of treatment by state paid and controlled doctors.

Reforms in American medical education, the growth of hospitals as centers of medical teaching and the increasing tendency toward specialization are well dealt with. "It is no longer possible to learn everything in medicine. . . . No wise physician is ignorant, however, of the truth that the practice of medicine, whether it be in the peasant cottage or in the towering medical center, depends first of all on the use of sound common sense. A broad general knowledge of the 'face of disease' is equally essential. . . . And the specialists who have added most to modern medicine have with few exceptions possessed good hospital training in general medicine or surgery before they narrowed their attention to one phase of medicine."

National schemes of medical practice and of group practice are briefly discussed. Some forty illustrations, including portraits and figures of historical interest, will help to fix facts in the mind of the reader. A good bibliography and an index are added. This book is well arranged and well written. It will be a source of correct information for the layman and a stimulus to further historical study to the young physician.

Fractures and Dislocations for Practitioners. By Edwin O. Geckeler, M.D. Third edition. Cloth. Price, $4.50. Pp. 361, with 320 illustrations. Baltimore: William Wood & Company, 1943.

The subject matter is efficiently and concisely condensed in this book. The physiology and mechanism of bone repair are described. The fundamentals concerning the examination, diagnosis, records, medicolegal aspects, complications of fractures and dislocations and the organization of fracture services are described. The chapter on emergency treatment includes the modern basic concepts. The principles of débridement of compound fractures and the detailed description of technic are very important for industrial surgeons and medical men of the armed forces as well as for general practitioners. Essential general points in reduction, immobilization, traction and follow-up treatment are described. A detailed plan for determining disability, essential in industrial and medicolegal cases, is described. Regional fractures are discussed in succeeding chapters, followed by several chapters on general considerations and specific description of the reduction and treatment of dislocations. The reader must be impressed with the well chosen illustrations, clearly reproduced. This book is of value to students and practitioners as well as to orthopedic surgeons and medical men of the armed forces.

Gastro-Enterology (in Three Volumes). By Henry L. Bockus, M.D., Professor of Gastro-Enterology, University of Pennsylvania Graduate School of Medicine, Philadelphia. Volume I: The Esophagus and Stomach: Examination of the Patient, and Diagnosis and Treatment of Disorders of the Esophagus and Stomach, Including Duodenal Ulcer. Cloth. Price, $12; $35, per set of three volumes and index. Pp. 831, with 134 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

This is the first of a set of three volumes to be devoted to gastroenterology under the authorship of a recognized leader in the field. The scope of volume I includes the examination of the patient, the anatomy and physiology of the esophagus and diaphragm, together with the conditions which affect them, and then a section on disorders of the stomach which could more properly have been called disturbances or diseases of the stomach, providing hundreds of pages on anatomy and physiology, disorders of secretion, gastritis, duodenal and peptic ulcer, carcinoma and other tumors, syphilis and other infections, and anomalies. The author recognizes that gastroenterology is one department of internal medicine and the necessity for thorough training in internal medicine before gastroenterology is adopted as a specialty. The space devoted to psychogenic factors in the considerations of symptomatology is quite inadequate in the light of modern points of view; nor is there much added in relationship to psychosomatic factors in the consideration of ulcer of the stomach and duodenum. The volume is impressive by the vast amount of material that it contains, and its practicality is immensely enhanced by the selection of excellent reports of cases. The colored pictures, which are numerous, and the quality of the illustrations generally also add greatly to the usefulness of this work. Subsequent volumes are to deal with the small and large intestine and the peritoneum, and the final volume on the liver, biliary tract and pancreas and secondary gastrointestinal disorders.

Pain Mechanisms: A Physiologic Interpretation of Causalgia and Its Related States. By W. K. Livingston, Lieutenant Commander (MC), U.S.N.R. Cloth. Price, $3.75. Pp. 253, with 26 illustrations. New York: Macmillan Company, 1943.

The subject matter of this monograph is of great complexity and controversy. It is quite an impossible task to present the material in the scientific language of the research worker in the fundamental sciences and at the same time make it acceptable to the clinician. The author compromises by recording the impressions derived from the work of many investigators and his own observations over a period of years. In section I the author provides his background for the book by including some of the anatomy and physiology of pain conduction, touching on the psychologic aspects of sensory perception and timorously invading the field of the neurophysiologist. Section II deals with the clinical aspect of pain and especially the study and interpretation of causalgia and its related states. He includes brief but well organized discussions on post-traumatic pain syndromes, chronic low back disability, facial neuralgias and phantom limb pain. In an effort to explain the mechanism responsible for these states he has presented certain findings that should hold practical importance in the treatment of the many cases which will most likely result from the present war. Having set forth this concept of pain, the author devotes section III to the interpretation of its possible mechanisms which have influenced his own approach to clinical problems. There are no final conclusions to be drawn from this study of pain mechanisms. The author does state a few convictions, but his impressions are too plastic to be called conclusions.

The Health of Children in Occupied Europe. International Labour Office. Paper. Price, 25 cents; 1s. Pp. 37. Montreal, 1943.

Under the auspices of the International Labour Office there comes from Montreal a report on the health of children in occupied Europe. The pamphlet first discusses the conditions from the point of view of dietary standards, reduction of rations and general living conditions, then considers the consequences in relation to the spread of disease, the rise in the death rate and the psychologic and social effects and finally draws some conclusions. The conclusions are, briefly, that the present conditions are bound to result in general deterioration of the physical and moral strength of the people, with depopulation. It is emphasized also that one of the primary tasks of the United Nations, when victory has been won, will be to bring immediate relief to the underfed and devitalized peoples of Europe. Unless this is done, the ultimate deterioration of all the people of the nations now occupied by the Nazis will in the end lead to the very domination that the Germans have fought for, regardless of who may be said to have won the war.

English-Spanish—Spanish-English Dental Vocabulary Including Many Medical Terms. By Joseph S. F. Marie. Cloth. Price, $4. Pp. 159, with illustrations. Lancaster, Pennsylvania: Jaques Cattell Press, 1943.

Without any attempt to provide definitions, this book gives in English-Spanish and in Spanish-English all the terms used in dentistry and a good many that are used in medicine. The increasing scope and quality of dentistry in the South American republics should earn for this book a suitable circulation.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

NOCTURNAL CRAMPS IN LEGS

To the Editor: **Is anything definite known of the etiology, pathology and treatment of "old age" cramps? The patient may make a quick movement in bed at night and is seized with cramps in the legs, feet or toes. I treated a patient who complained of these cramps recently, on a strictly empirical basis, by prescribing 100 capsules of adrenal cortex liquid. In one week the cramps ceased and have not reappeared. Since this remedy gives support to only the adrenal glands, I am wondering if they play any etiologic part in the production of the cramps.**

T. H. Standlee, M.D., Mirando City, Texas.

ANSWER.—Nocturnal cramps in the lower extremities, occurring during bed rest and frequently awakening the patient, are not limited to the senile. They occur fairly frequently in pregnant women, especially during the second half of pregnancy. They also may be most annoying to relatively young men and women. The usual phenomenon is muscular spasm with intense discomfort, not dissimilar to the cramps occurring in swimmers and especially in those exerting themselves violently (ineffective, poor or panic stricken swimmers) in cold water. The episodes are closely related both in their subjective distress and in their pathogenesis to the painful attacks in intermittent claudication (Wright, I. S., chapter 30, Arteriosclerosis, in Stieglitz, E. J.: Geriatric Medicine, Philadelphia, W. B. Saunders Company, 1943).

Investigations into the etiology, pathogenesis and therapy of these cramps are continuing and our present concepts must be considered as tentative working hypotheses rather than final and dogmatic explanations. The basic mechanism seems to be a relative histanoxia of the muscle tissue. The studies of Sir Thomas Lewis and his associates (Lewis, Thomas; Pickering, G. W., and Rothschild, P.: *Heart* **15**:359 [July] 1931) indicated a close parallelism between these phenomena and the pain of angina pectoris. If at a certain level of work (metabolic demand) the oxygen available is insufficient, pain arises. Either reduction of the demand, as in arresting effort in intermittent claudication or angina pectoris or improvement of the tissue respiration by increasing the blood supply (vasodilators in angina pectoris) brings relief. There is some evidence that accumulation of metabolic debris from the working muscle may be the specific mediator in inducing pain. Lewis discusses this P (pain) factor in detail. Histamine has been suspected as the P factor, but more recent studies tend to incriminate lactic acid and especially potassium ion (Harpuder, Karl, and Stein, Irwin D.: *Am. Heart J.* **25**:429 [April] 1943).

The clinically significant fact is that such cramps arise when the tissue respiration is interfered with, usually as a result of an inadequate local circulation. Two factors other than histanoxia are also clinically significant: the availability of dextrose to the muscle fibers and the concentration of calcium in the blood. Hypoglycemia may induce attacks of angina pectoris; oxygen is relatively useless to working muscle cells unless there is enough dextrose to be oxidized and insulin to catalyse the reaction. This factor is particularly prominent in the pathogenesis of painful muscle cramps in older persons. Elderly diabetic patients do not do well on regimens which are too rigid and in which the blood level of dextrose is kept low; the frequency of anginal attacks is then greatly increased. It must not be forgotten that the longest interval between feedings is at night and that with age the homeostatic mechanisms maintaining the level of sugar in the blood become less and less effective.

Frequently depletion of the blood calcium is associated with a tendency to nocturnal muscle cramps and spasms. Most of these patients admit that they consume almost no milk, the major dietary source of calcium. The hypocalcemia observed in hypoparathyroid tetany is well known. The adrenal secretions are also involved in the control of muscle tone. During the second half of gestation there is a considerable drain on the maternal calcium because of the rapid growth of fetal bone. Oral administration of calcium will in many instances greatly diminish or wholly arrest these recurrent and distressing cramps.

In the elderly, nocturnal cramps are most likely to be associated with impaired circulation due to arteriosclerosis or vascular spasm, with some possibility of nocturnal hypoglycemia as a contributory factor. Though it is commonly assumed that external heat improves the peripheral circulation and that therefore the quiet warmth of the bed should prevent rather than enhance the occurrence of muscular histanoxia, recent studies have convincingly demonstrated that heat increases the metabolic needs, whereas refrigeration decreases the metabolic level, so that if a limb is kept cool a poor circulation may be adequate (Bowers, W. F.: *Mil. Surgeon* **93**:289 [Sept.] 1943). It is thus perfectly feasible to consider that the warmth of the bed may contribute to the occurrence of such cramps.

Therapy should wait on as precise a diagnosis as possible. Study of the circulatory efficiency of an extremity, x-ray films to reveal calcification of the major arteries, determination of the fasting blood sugar and blood calcium concentrations should precede the outlining of a therapeutic regimen. When these factors are properly evaluated, correction of the physiologic imbalance is rarely difficult.

MORPHINE AND EPINEPHRINE IN SHOCK

To the Editor: **—Is morphine sulfate, administered intravenously, indicated in traumatic shock? If so, in what doses? In what dilution should epinephrine in plasma be injected to combat traumatic shock? Should 1 cc. of 1:1,000 solution of epinephrine be diluted in 500 cc. or in 1,000 cc. of plasma?**

Albert Borges, M.D., Endicott, N. Y.

ANSWER.—Relief of pain is one of the primary principles in the treatment of traumatic shock. The usual procedure is to administer ¼ or ½ grain (0.016 or 0.032 Gm.) of morphine sulfate subcutaneously. The intravenous route in the administration of morphine has been little used, but according to the available evidence reviewed by Presman and Schotz (*Anesthesiology* **4**:53 [Jan.] 1943) it offers quicker relief of pain without eliciting undesirable reactions. However, in traumatic shock—and for that matter, in any type of shock—due consideration should be given to the possible harm which may result from the powerful depressant action of the drug on the respiratory center. Anoxia is one of the major factors in the production and probably in the determination of irreversibility of shock. Until more evidence has accumulated that the intravenous administration of morphine in shock does not cause any higher degree of respiratory depression than that caused by an equally effective dose of morphine injected subcutaneously, the latter route should be advocated.

The administration of epinephrine in shock is a common malpractice based on the fact that the most apparent immediate effect of this drug is a rise in blood pressure. This effect, the result of arteriolar constriction, is rapidly followed by a secondary prolonged lowering of blood pressure due to generalized capillary dilatation. Both actions are aggravating factors in shock, in which there already exists a maximal reflex arteriolar contraction with universal capillary dilatation. In fact, a slow intravenous infusion of epinephrine has been shown to produce in normal animals a picture similar to shock (Bainbridge, F. A., and Trevan, J. W.: *Brit. M. J.* **1**:381 [March 24] 1917 and Cannon, W. B.: *Ann. Surg.* **100**:704 [Oct.] 1934). Therefore it cannot be too much stressed that the use of epinephrine in shock is contraindicated.

HAZARDS TO SKIN OF ULTRAVIOLET THERAPY

To the Editor: **—During a lecture on electricity given at this station recently by Mr. Irwin Moon of the Moody Bible Institute a question arose which you may be able to clarify for us. Mr. Moon declared that the use of ultraviolet rays can be harmful to the user and often causes ulcers of the skin. This statement naturally made a strong impression on a number of men on the station whose work involves the use of ultraviolet, and it was thought that if we could publish a statement in refutation it would do much to improve the morale of the men affected. Any additional information which you are able to supply us in this matter will be greatly appreciated.**

MC, U.S.N.R.

ANSWER.—Like most therapeutic methods of value, light therapy is not fool proof. Some human skins cannot react to light by tanning but simply burn or at best become freckled. Such skins, after years of exposure to strong sunlight as necessitated by certain outdoor occupations, may develop epitheliomas which are prone to ulcerate. But artificial light can hardly be accused of this injury, for there is no reason why any one should be subjected to artificial ultraviolet light in such a way as to cause epitheliomas even in susceptible skin. The lamps used for illumination in industrial plants are made of glass, which cuts out the ultraviolet rays. Those who work with therapeutic lamps can protect themselves easily. These injuries are effected only by constantly recurring irritation over long periods.

The danger of excessive exposure to sunlight of normal persons is common knowledge, but people often fail to realize that ultraviolet lamps used in excess may have similar effects. Cases of severe dermatitis and illness resembling sunstroke are too frequently seen in persons who attempt to use ultraviolet light

without proper instruction or who fall asleep under the light. An extreme example is quoted by Paul E. Bechet (Common Sense Under the Sun, *Hygeia* **20**:507 [July] 1942). A woman aged 42 received a great overdose of ultraviolet light. Not only did she suffer a severe dermatitis, but ulcers developed in the gastrointestinal tract just as they do in some severe heat burns, and the patient died on the twelfth day. Such cases are useful warnings against self treatment without full instructions and all precautions.

Attendants who work under ultraviolet light as in rooms lighted from the ceiling receive small doses of light because of the distance of the lamps. Beginning with such mild dosage the skin becomes accustomed to the light and gradually acquires resistance. The dose of light for the patient must be determined by the physician, who can rule out the cases of hypersensitivity and, knowing the output of the lamp, can estimate the response to the rays of the portion of the skin to be treated. Careful measurement of distance and accurate timing are essential. No lay person should attempt to treat himself without the advice of a physician, thorough instruction in the management of the lamp and adequate precaution against falling asleep under the light. An alarm timer or an automatic cutoff timer will furnish such protection. With proper use of the lamp there need be no fear of harm from actinotherapy.

X-RAY MOTTLING OF LUNGS FROM IODIZED POPPYSEED OIL

To the Editor:—**In 1931, while a resident in the hospital, a doctor inhaled a quantity of lipiodol and then was x-rayed. He was not x-rayed again until he was inducted into the Army, at which time his film was interpreted as normal. About one year later during a routine examination his x-ray film showed what was immediately diagnosed as typical pneumonia in both bases. Subsequent films during the next four months showed little if any change. Just yesterday his induction film was obtained and there is little difference in the appearance of the bases in that as in present ones taken sixteen months later. These films have been seen by several competent roentgenologists, and they have concurred on the diagnosis of a typical pneumonia. The patient is and always has been symptomless. Is it possible for the iodized oil to be absorbed and for it to produce a tissue reaction such as seen in silicosis? I would appreciate any information on tissue reaction from iodized oil and any suggestion as to what this pneumonitis might be and whether any further investigation is warranted.**

Captain, M. C., A. U. S.

ANSWER.—Iodized oils instilled into the bronchi for purposes of bronchography may frequently be visualized on x-ray examinations indefinitely as a fine mottling in both pulmonary bases. The major portion of the oil is coughed out of the bronchi within a few minutes to a few hours. However, very small droplets which reach the periphery are phagocytized and apparently produce no reaction, although their presence is apparent roentgenologically. Oils which are chemically unsaturated, such as cod liver oil, or the paraffin base oils, such as mineral oil, do produce reactions known as "lipid pneumonia" and paraffinomas. The chemically saturated oils, such as lipiodol, which is iodized poppyseed oil, apparently produce no tissue reaction. With the complete lack of symptoms of the patient described, it would appear that the supposed pneumonitis is simply the finely divided lipiodol residue and that no further investigation is warranted.

IMMUNE GLOBULIN AND ANAPHYLACTIC SHOCK

To the Editor:—**A girl of 5½ was given 2 cc. of immune globulin two weeks previous to the time of exposure to a case of measles; subsequently she developed measles and on the second day of the disease she was given 2 cc. more of immune globulin. Two hours after the injection she had a severe chill, let out a frantic scream and lapsed into a coma within an hour, her temperature being about 101 F. Despite heroic measures, adrenalin, oxygen, and the like, she died nine hours after the onset of the reactive symptoms. Were the reactive symptoms due to allergy? Do the symptoms suggest an acute encephalitis? What further treatment would have helped? How can one foretell if immune globulin will sensitize the patient to a subsequent injection?**

Captain, M. C.

ANSWER.—The description of this case indicates that death was due to anaphylactic shock. Although there was probably hyperemia of the brain, the duration of illness seems too brief to justify a diagnosis of acute encephalitis. Pulmonary edema often develops in such cases; if it was present, atropine sulfate might have been useful. If there was cyanosis, a carbon dioxide-oxygen mixture could have been used instead of oxygen alone. Heart stimulants are sometimes required. Hypertonic dextrose may be of value. Also if possible it is well to apply a tourniquet above the site of the injected material that caused the reaction in order to check absorption. Calcium gluconate, often used for serum reactions, is likely to be disappointing. It seems extremely doubtful if there are any known measures which would have saved the life of the patient.

If injections of biologic substances are made at intervals not in excess of one week, severe reactions are of less frequent occurrence than when the spacing is much longer. One cannot foretell whether immune globulin will sensitize a patient to a subsequent injection. It should be of interest to know whether the child concerned had a history of allergy.

TRANSIENT HYPERTENSION IN PUERPERIUM

To the Editor:—**In connection with the obstetric work done by our service (Frontier Nursing Service) I have encountered an obstetric condition about which I can find no literature and which I have not encountered previously in any of my work or experience. The condition is that many women have had an apparently normal antepartum course with no evidences of toxemia, have a normal delivery and in their postpartum period develop a high systolic blood pressure (160-190) with a correspondingly high diastolic pressure, the onset being anywhere from the third day until the tenth day and the condition lasting from a few days to several weeks. These patients show no signs at all of toxemia, have no complaints and are apparently in normal health except for the unduly high blood pressure. Residual changes are not noted in the patients later. Can you give me any help in diagnosing more definitely the condition present, in finding any literature on the subject or in explaining the condition in any way?**

James M. Fraser, M.D., Hyden, Ky.

ANSWER.—A moderate rise of both systolic and diastolic tension is common in recently delivered women. It has been but little studied, probably because the majority of obstetricians do not follow the postpartum blood pressure when it is not elevated antepartum. The wavelike rise usually begins about one hundred hours after delivery and is commonly coincidental with the onset of lactation. During the final month of gestation there is usually a gradual rise in the arterial tension associated with a moderate fall in the blood calcium concentration (Stieglitz, E. J.: *Arch. Int. Med.* **39**:465 [April] 1927). Immediately after parturition the blood pressure falls and the blood calcium level rises correspondingly. The later rise of the blood pressure, often to levels considerably higher than those observed during pregnancy, coincides with the onset of lactation and a sharp, though transient, drop in the blood calcium concentration. This phenomenon occurs both in women with normal arterial tension and in those with preexisting hypertensive disease or toxemia of pregnancy (Adair, F. L, and Stieglitz, E. J.: Obstetric Medicine, Philadelphia, Lea & Febiger, 1934, chapter 22). It is quite probable that a previous calcium deficiency may exaggerate and/or prolong the postpartum rise. There is no evidence to suggest that this transient hypertension is a precursor to progressive hypertensive arterial disease.

VIRUS PNEUMONIA

To the Editor:—**I have read with interest the reply to Dr. John D. Blackburn's inquiry concerning the management of virus pneumonia (The Journal, Nov. 13, 1943, p. 733). It is stated that "several observers, chiefly roentgenologists, state that roentgen therapy aids in shortening the disease, but in the absence of control cases this must be accepted with reserve." I should like to call attention to a study by Lieuts. Howard L. Correll and Irving I. Cowan (MC), U.S.N.R., in which an analysis of therapeutic results in 155 cases of primary atypical pneumonia was undertaken. The essential features of this investigation are summarized in the accompanying table. The patients were routinely given**

Response to Various Forms of Treatment

Treatment	Number of Patients	Total Sick Days	Total Days of Fever	Total Days to Clear by X-Ray Film	Days Sick Before Therapy	Days to Clear by X-Ray Film After X-Ray Therapy
Routine *	72	11.8	6.8	23.4	...	...
Sulfathiazole	41	12.5	6.5	21.2	...	...
Sulfanilamide	10	11.8	6.4	20.0	...	...
X-ray treatment, acute cases	23	8.4†	3.8†	8.3†	3.0†	...
X-ray treatment of unresolved pneumonia	9	....	...	....	33.3‡	4.0‡

* Bed rest, symptomatic therapy.

† One patient who developed pleural effusion the day of therapy is the single failure to respond and is not included in the calculations of treatment results.

‡ Two of the 7 patients who failed to clear within one week of x-ray therapy are considered failures to respond and are not included in the treatment response data.

112 roentgens over the involved lobe, and this was repeated in twenty-four hours if a favorable response was not elicited. Two treatments were usually required. While this series of cases has not been subjected to statistical analysis there is a distinct clinical impression that roentgen therapy reduced the total sick days, the total days of fever and the days required to resolve the pneumonic lesion.

Albert Paul Krueger, Captain (MC), U.S.N.R., Berkeley Calif.